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VOLUME XCVIII, NUMBER 767 FEBRUARY 1941

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National Emergencies

"CORN STATES"

I

It is not generally known that the official army ration of the United States is based upon pork—bacon—as the unit for computing the caloric needs of an army personnel. Nor is it generally considered that the quantity of that unit available for emergencies such as arise when large numbers of the population are mobilized for military purposes can be assured only by the watchful efforts of the veterinary profession.

II

More specifically, it is not generally understood that the expertly trained veterinarians deployed throughout the "Corn States" region safeguard the commanding unit of the diet required for the sustenance of both the civilian and military throngs of our population, by curtailing the disease hazard of swine breeding.

III

Nor should it be overlooked that producing the abundant supply veterinarians require to meet emergencies is a national service that is kept uppermost in mind by

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Indianapolis Association's Host, August 11-15, 1941

AUGUST 11-15, 1941, are the dates set for the 78th annual convention of the American Veterinary Medical Association. There are over 600 veterinarians in Indiana and each one has pledged himself to make your visit to this meeting one that you will long remember. These 600 hosts are from every walk of veterinary life: practice, military, research, education, regulatory and commercial.

HUB OF VETERINARY POPULATION

Indianapolis is one of the most conveniently located cities in the country. It is within a 30-hour ride of 85 per cent of the population of the United States. More veterinarians live within a radius of 500 miles of Indianapolis than within a similar radius of any other large city in the country. The city is easy to reach by train, airplane, bus or automobile. It is the converging point of a vast network of 17 entering steam railroads and 11 national and state highways and is on the routes of 18 national and state bus lines. It is one of the major ports of call for TWA, Eastern Airlines and American Air Lines.

Soldiers' and Sailors' Monument in Monument Circle—located in the heart of downtown Indianapolis.

CITY HAS MANY ATTRACTIONS

Indianapolis is a beautiful city—worth visiting for that reason alone. Broad streets and boulevards, magnificent monuments, attractive parks and handsome homes all add to its individuality.

Members of the AVMA will wish to see such interesting places as the former homes of James Whitcomb Riley, Benjamin Harrison, Booth Tarkington, Meredith Nicholson, and Charles Warren Fairbanks; the Indiana Soldiers' and Sailors' Monument; Indiana's $15,000,000 World War Plaza; American Legion National Headquarters; Indianapolis Motor Speedway; the Sunken Gardens of Garfield Park, and many of the more interesting industrial plants.

Your next convention city is laid out on a plan similar to that of the nation's capitol: a central circle with four radiating avenues. At the hub of the city is Monument Circle, the site of the famous Soldiers' and Sailors' Monument—long one of the city's

University Park, showing World War Memorial in distant center. One of the show places of Indianapolis, it is conceded to be one of the finest memorials in the world.

most distinguishing marks. It is second only to the Washington Monument in height and is regarded as the finest piece of monumental architecture in the world.

37 Recognized Hotels

The city's 37 recognized hotels, representing more than 7,000 rooms, will be prepared to extend true Hoosier hospitality.

Hundreds of veterinarians, convention-bound toward Indianapolis, will pass over a part of Indiana's 12,000-mile network of modern state highways. They lead through ever-changing and ever-interesting scenery —from the industrial areas and the beautiful lake regions of the north through the rich agricultural middle section to the rugged, picturesque country of the south with its mines and river ports.

The state parks, offering ideal facilities for a day or a week stopover as an adjunct to the convention trip, are the pride of all Hoosierdom. It matters not what direction you are coming from, you will find one or more of these splendid parks either on your highway or so near it that you can not afford to miss the opportunity of paying it a visit.

Committee on Local Arrangements

Following is the membership of the Committee on Local Arrangements:

J. L. Axby, *General Chairman*, 209 State House, Indianapolis.

R. E. Kepner, *Assistant General Chairman*, 1320 Vine St., New Castle.

C. C. Dobson, *General Secretary*, New Augusta.

Frank H. Brown, *Hotels*, 3428 Kenwood Ave., Indianapolis.

Walter K. York, *Public Relations*, 3032 N. Illinois St., Indianapolis.

J. C. Schoenlaub, *Entertainment*, Box 1233, Indianapolis.

J. L. Kixmiller, *Commercial Exhibits*, 4144 N. Capitol Ave., Indianapolis.

W. A. Sullivan, *Educational Exhibits*, 509 Federal Bldg., Indianapolis.

Mrs. J. C. Schoenlaub, *Ladies' Entertainment*, Box 1233, Indianapolis.

G. E. Botkin, *Banquet and Dance*, 224 W. Second St., Marion.

D. D. Baker, *Alumni Dinners*, 440 N. Wabash St., Wabash.

H. W. Demsey, *President's Reception*, 238 E. Washington St., Huntington.

Edgar D. Wright, *General Chairman of Clinics*, Route 10, Fort Wayne.

C. C. Donelson, *Large Animal Clinic*, Route 11, Box 320, Indianapolis.

H. W. Brown, *Small Animal Clinic*, 623 W. Main St., Fort Wayne.

L. P. Doyle, *Sheep and Swine Clinic*, Purdue University Agricultural Experiment Station, West Lafayette.

F. C. Tucker, *Poultry Clinic*, Claypool.

R. J. Hoskins, *Parking of Automobiles*, 3203 E. Washington St., Indianapolis.

C. Harvey Smith, *Restraint and Anesthesia*, Route No. 1, Crown Point.

Veterinary Service of a State*

W. J. BUTLER,† D.V.S.
Helena, Mont.

WE ARE JUDGED by the character and results of our work. It is impossible for a livestock sanitary official to give adequate protection to the livestock industry of his state and to the people of the state unless he has a sound organization behind him.

In a subject so vitally important to the veterinary profession, as well as to the livestock industry, there undoubtedly will be some disagreement on what we say in this paper. That is well. It will demonstrate that at least we are thinking. We make our statements and suggestions with the sincere desire to improve our service.

A Plan of Organization of the State Veterinary Service

In this paper under the powers we suggest for a livestock sanitary board, we have not given an exhaustive legal phraseology of such powers. That is a lawyer's prerogative. We simply have endeavored to give a summary of the powers required and desired. We realize that the terms "livestock sanitary board," "executive officer," "state veterinary surgeon," "deputy state veterinary surgeons" and their various classifications may not be acceptable to some states and may be improved upon. These are, however, the titles we use in Montana. Perhaps the terms "state veterinarian" and "assistant state veterinarian" are better.

State Sanitary Service Should Be Independent Unit

We believe that a state sanitary service should be a separate department. It should not be a subdivision of a department of agriculture. Agriculturists are interested primarily in agriculture and are not versed in the science of preventive medicine. I remember that not long ago the livestock industry of the United States undoubtedly was saved from a calamity by the action of one veterinarian of outstanding moral courage and professional ability who refused to accept the instructions of one who was versed in agriculture, but not in preventive medicine. We are of the opinion that the domination of agriculture over preventive veterinary medicine has done much to retard the progress and recognition of veterinary medicine. We believe in livestock sanitary boards as a separate department made up of at least six members, two of whom would be veterinarians, two of whom would be livestock men actually engaged in the production of live stock, and the other two members we would leave to the discretion of those who proposed the law. They could be livestock growers or veterinarians, or medical men trained in preventive medicine, or agriculturists. We have mentioned six men, as we believe that the chairman should not vote excepting in the case of a tie vote.

The members of the board should be appointed for a term of six years so rotated that the terms of two members would expire each two years. Under this plan the personnel of the board, under reasonable conditions, would not be changed in any one year.

Scope of Duty and Authority of State Veterinarian

The board should have authority to appoint its chief executive officer, who also would act as the state veterinary surgeon. He should be a graduate of a recognized veterinary college and qualified to practice veterinary medicine in the state of which he is the state veterinary surgeon. He should act as the secretary of the board and, subject to the rules and regulations of the board, he should have power to act for

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†State veterinary surgeon and executive officer, Montana Livestock Sanitary Board.

and perform the duties imposed by law upon the board when that body is not in session. However, in order to have a check upon his actions, any rule or regulation promulgated by him should be subject to review, modification or annulment by the board at its next or any subsequent meeting. The executive officer, by and with the consent of the livestock sanitary board, should have authority to appoint inspectors, deputy state veterinary surgeons and other agents and assistants whose duty it would be to act under his direction. Naturally, all deputy state veterinary surgeons should be graduates of recognized veterinary colleges, and licensed to practice veterinary medicine in the state of which they are agents of the board.

He also should have authority, by and with the consent of the board, together and with the approval of either the federal veterinary inspector in charge or the chief of the United States Bureau of Animal Industry, to appoint federal veterinary inspectors stationed in his state as special deputy state veterinary surgeons, with the powers and duties of deputy state veterinary surgeons or agents, to act without compensation and to hold office at the discretion of the board.

POWERS OF LIVESTOCK SANITARY BOARD

The livestock sanitary board should have the following powers:

1) To supervise and control the action of the state veterinary surgeon, all deputies, inspectors and other employés and describe their duties, compensation and tenure of office.

The salaries of the executive officer and assistants should be commensurate with their duties and adequate to make them independent of private practice or other work.

Under this power the livestock sanitary board should provide that all practicing veterinarians who desire to become affiliated with the board should be given a resident deputyship provided that they have demonstrated their fitness for such appointment either by oral or written examination such as is required for district deputies. Such resident deputyship would carry with it the powers of a regular salaried deputy when called upon by the board to do official work. When employed on such official work, the resident deputies should receive a *per diem* of not less than $10 together with their actual traveling and subsistence expenses.

2) To remove any one or more of its appointees, subordinates or employés for cause after charges of unfitness have been filed with the board and a fair and impartial hearing has sustained the charges.

3) To supervise the sanitary conditions of live stock in their state, and promulgate reasonable rules and regulations for the carrying out of this duty and have authority to quarantine and order and supervise treatment of any animal affected with or exposed to a communicable or dangerous disease, and to perform any duty which in their judgment is reasonable and which they consider necessary to control or prevent such diseases. This duty should also be extended to include disease-carrying media by which disease could be transmitted to live stock.

We do not include dogs or wild game as live stock. We believe dogs and wild game should not specifically come under the jurisdiction of the board unless they prove to be carriers of a disease transmissible to live stock. When dogs or wild animals or other animals, feeds, vehicles, or other agencies in the judgment of the board are found or are believed to be carriers of a disease that may be transmitted to live stock, the board should have complete authority over the control, treatment, and handling of such disease-carrying media. Poultry should be included as live stock.

4) To investigate disease and other subjects relating to the prevention and control of livestock diseases or the care of live stock and its products. To this end they should have authority to establish and maintain a laboratory and to make or cause to be made biological products, curative or preventive agents, and to do or perform such other acts as in their judgment are

necessary to the welfare of the livestock industry.

We do not believe that livestock sanitary board laboratories should make it a routine practice to prepare biological products. We do believe, however, that they should have the authority to prepare such products when not commercially available.

5) To promulgate and enforce reasonable rules and regulations and orders to prevent the introduction of livestock diseases into their state or media that are carriers of disease that may be transmitted to live stock, and to this end they should have authority to order and supervise treatment of animals or disease-carrying media and to inspect, test and quarantine live stock imported into their state, when they consider it necessary.

6) To have supervision over meat inspection and the production and distribution of milk and milk products, other than manufactured products, such as butter, cheese, etc.

In order to have a flexible organization the board should have authority to promulgate all rules and regulations as to the standards and sanitary conditions governing such operations.

7) To have supervision and control of manufactured and refined foods used for live stock; also supervision over the manufacture, importation, and use of biological or curative agents for the treatment of diseases of live stock.

8) To condemn live stock and property under the due course of law.

9) To indemnify owners of live stock or property destroyed by order of the board.

10) To be invested with adequate police powers.

Some of these provisions may appear to be drastic; however, they are not. Practically every provision that I have mentioned is contained in the federal law providing for the creation of the United States Bureau of Animal Industry. When one is dealing with dangerous diseases, he must be given adequate authority if he is to act promptly and efficiently. In the control of dangerous diseases, if prompt and efficient action is not taken disaster is likely to occur. The onset of a dangerous livestock disease may be compared to a forest fire. If caught at its inception and prompt action taken, it is easy to control. If once it gets away, it means a long and hard and costly battle to eradicate it.

We believe in centralizing authority in the state veterinary surgeon so that we can act immediately. Naturally, in carrying out any law where police powers are granted to a department, discretion must be used and these police powers must not be abused. Abuse of authority always leads to the destruction of an organization.

Organization of the State Veterinary Service of Montana

In the State of Montana we have the powers cited. We have a livestock sanitary board appointed by the governor. It is composed of stockmen actually engaged in the production of live stock. They are appointed for a term of six years and serve without pay. They receive only their actual subsistence and expenses incurred while going to and from a meeting. The men who drew up the law felt that in this way they would get the best possible material in that there would be no political or financial incentive and that the members of the board would perform their duties with a sincere desire to build up a strong organization for the protection of the livestock industry. We do not say that in all states members of the board should act without compensation, but in the State of Montana it has worked very well and with no objection whatsoever upon the part of any member of the board.

In our state the board appoints its executive officer, who acts as the state veterinary surgeon and has power to act for the board, not only in carrying out their orders, but also in promulgating new regulations when the board is not in session.

This board also acts as the livestock commission, which has to do with the recording of brands, the supervision of livestock markets and the employment of brand inspectors and stock detectives. These two

boards acting as one board make it possible for the disease-control organization to immediately locate the owner and the source of any animal that may be found diseased upon postmortem inspection or otherwise, through the system of recording brands. This system extends to the various primary markets where Montana live stock are shipped, as the livestock commission maintains brand inspectors at all of the principal primary markets to which Montana live stock are shipped.

The board averages five meetings a year. However, at each meeting they review the actions of the executive officer during the interim of meetings. He sends them a monthly report of disease conditions, as well as a financial report so that they can keep in touch with disease-control work, even though they may not actually hold many meetings. Naturally, in case of an emergency the board is immediately called into session. Under the by-laws of the board, they may be called into session by the chairman or the executive officer, or at the call of any three members.

There is one provision that we do not have, which we believe should be incorporated in every law creating a livestock sanitary board, and that is a provision for civil service and a retirement policy.

THE DISTRICT DEPUTY STATE VETERINARY SURGEON

In the State of Montana we have made it a practice for many years to divide the state into districts, with a full-time paid veterinarian in charge of livestock sanitary board work in each district. These veterinarians are classified as district deputy state veterinary surgeons. Inasmuch as Montana is a large state with areas where veterinarians are few and far between, it has been the policy of the board to permit district deputies to practice veterinary medicine when such work does not interfere with their official duties or with the practice of a practicing veterinarian. We do not recommend this procedure as an ideal practice. It is permitted in Montana to meet existing conditions.

THE RESIDENT DEPUTY STATE VETERINARY SURGEON

We also have made it a practice to appoint practicing veterinarians as resident deputy state veterinary surgeons in the various sections of the state after proper qualification. This appointment carries with it authority to make interstate inspections of live stock and to legally carry on official work, when they are requested to do that work by the state veterinary surgeon. It is the practice of the Montana Livestock Sanitary Board to budget out each year a certain sum for each resident deputy state veterinary surgeon. The amount of money budgeted to the individual resident deputy depends upon the total amount of money available, together with the estimated cost of work necessary in his particular district. This budget is flexible.

This system has proved satisfactory for our purposes. We realize that it has some drawbacks and that it may not be applicable to all states. We have had very few complaints from practicing veterinarians relative to district deputies practicing. Most assuredly, this system has proved of considerable value to practicing veterinarians, not because of the immediate money income alone, but because official work carries them to many ranches where owners become acquainted with them and their work, and later call upon them for private services.

PRODUCTION AND DISTRIBUTION OF MILK AND CREAM UNDER VETERINARY DIRECTION

In the State of Montana since 1921, the livestock sanitary board has had complete supervision over the production and distribution of milk and cream. During this period every rule, regulation or standard governing such products has been promulgated by the board, and all inspections, and tests of dairies or dairy cattle, or of milk or cream, have been made by the board.

THE STATE-WIDE DAIRY INSPECTOR

District deputies, in addition to their other duties, are charged with the supervision of dairies, and milk and cream, in their respective districts. We also have a deputy state veterinary surgeon who is a state-wide dairy inspector. He travels over

the state and advises the district deputies. When necessary, the district deputy accompanies him on an investigation. If the state-wide dairy inspector finds any dairy operating in violation of existing regulations, he takes immediate action, but notifies the district deputy as well as the office at Helena of such action. The district deputy is given a list of all changes or improvements which the state-wide dairy inspector may order to be made and it is the duty of the district deputy to follow up that work and see that the orders are carried out. These provisions apply where a resident deputy is performing official dairy-inspection duties, as in outlying districts or in areas where the service of a district deputy is not immediately available.

It is not to be understood that this state-wide dairy inspector visits every dairy or milk plant and does all official dairy inspection. Far from it. He acts strictly in a supervisory capacity, going from district to district and giving assistance and guidance to the district deputy or the resident deputy, as the case may be. The district deputy is in charge of his district, as is the resident deputy when assigned to a special area. All deputies receive special training from time to time, not only from the state-wide dairy inspector, but also at the livestock sanitary board laboratories at Helena, in dairy work and in other phases of disease-control work.

Deputy state veterinary surgeons collect and send in milk and cream samples to be analyzed and given a bacteriological examination at the board's laboratories. This examination includes chemical examination and bacterial count, streptococci determination and typing if streptococci are found, *B. coli* determination, and Brucella agglutinin determination. We have found animals that gave a positive reaction to the milk-sera test for Bang's disease when such animals did not react to the blood test for Bang's disease. A phosphatase test is used to determine whether or not milk has been properly pasteurized. We also attach to the original laboratory report a sedimentation disc pad, covered with a cellophane disc, which shows whether or not the sample contained dirt.

The laboratory reports of milk and cream examinations are made in triplicate. If any fault is found with the sample, the original and duplicate reports are forwarded to the deputy who collected the sample, with instructions to personally deliver the original to the operator of the dairy and see that the fault is corrected. We have found that follow-up work consistently and efficiently carried out is essential in dairy as well as in all disease-control work. Where no fault is found with the milk sample, the original is mailed to the dairy operator and the duplicate to the deputy.

MEAT INSPECTION

Under authority to provide for meat inspection we have provided state meat inspection in localities where we have been requested or where we consider it necessary. Our meat-inspection system is only in its infancy, but our milk inspection has been carried on with good results and, we believe, with credit to the veterinary profession.

SPECIAL FUND SET ASIDE FOR EMERGENCY DISEASE CONTROL

By a special tax on live stock we have provided an emergency fund which is invested in state or federal bonds of ready market value. Money from this fund can be spent only when an emergency is declared to exist by the state board of examiners (composed of the governor, the attorney general and the secretary of state) and the livestock sanitary board. This fund is held as a reserve for use in controlling dangerous diseases, such as foot-and-mouth disease, when other funds become exhausted.

District deputies are required to report immediately to the livestock sanitary board the appearance of any dangerous disease or of any condition pertaining to live stock that may be considered dangerous. They are required to report routine work in detail each week. Resident deputies must report immediately the results of any official

inspection which they may make. In this way the state office is kept in constant touch with disease conditions in the state. We have made it a practice for many years to issue monthly letters to all veterinarians in the state, giving them a brief summary and outline of disease conditions found during the month.

ENFORCEMENT OF LIVESTOCK SANITARY LAWS

We do not believe in severe criminal penalties as a routine procedure, but we do believe in a provision such as we have in Montana, making any person or corporation violating any of the provisions of the livestock sanitary board or the state veterinary surgeon, civilly liable for damages which may be sustained by any person or persons by reason of such violation, in a civil action in any court of competent jurisdiction.

We have found a chemical and bacteriological laboratory indispensable for the proper operation of the board.

General Considerations

CLOSER COÖPERATION BETWEEN RESEARCH LABORATORIES AND LIVESTOCK BOARDS URGED

Research laboratories would undoubtedly be in a better position to carry on their work if they were more closely connected with livestock sanitary boards, rather than solely with agricultural institutions. We realize that this statement may meet with criticism, but it is our belief that research men would profit from being directly in touch with field veterinarians, and with the actual disease conditions that exist in a state. Properly correlated research work would undoubtedly do away with much duplication that now exists and would give the field veterinarian a better understanding of the research worker's problems, as well as give the research worker a better understanding of the field veterinarian's problems.

In Montana we have a research laboratory located at the state agricultural experiment station. The veterinarian in charge of the laboratory is a joint employé of the livestock sanitary board and of the experiment station and is in constant touch with the operations of the board.

PREVENTIVE VETERINARY MEDICINE

We have only scratched the surface in preventive veterinary medicine. There is need for veterinarians, not only in the application of preventive veterinary medicine in the control of communicable diseases, but also in its application to animal nutrition and husbandry and in the sanitary supervision of animal products offered for human consumption.

UNIFORMITY NEEDED IN DISEASE-CONTROL REGULATIONS OF THE VARIOUS STATES

When one studies the regulations of the individual states and the laws governing disease-control work in the various states, he is astonished at the diversity of opinion that exists among us as a profession over the procedure to be carried out in the control of livestock diseases. In reading the regulations governing the importation of live stock into the various states, we run into a mystic maze. This is a subject that has been under discussion to my personal knowledge for the past 27 years. We are no further advanced today in uniform regulations than we were 27 years ago. This does not speak well for us as a profession or for the various livestock disease-control authorities. We in Montana are not above criticism in this respect and we doubt that there is a state in the Union whose regulations may not be constructively criticized.

When are we ever going to get even fairly uniform interstate regulations as well as state regulations? Not until we get fairly uniform state veterinary service.

The outlook for uniformly well-organized state veterinary service is more favorable than it has been. The majority of states render an excellent service. We believe that such states are deserving of more recognition from the federal government than they receive at the present time. Under the present scheme of affairs well-organized state veterinary service receives less financial support proportionately than

do states that depend chiefly upon the United States Bureau of Animal Industry for carrying out their main disease-control program.

We realize that one of the essential duties of the Bureau is to control and eradicate livestock diseases in the entire United States, and not simply in any one state or group of states. This duty may require that body to step in when a state lags behind to such an extent that livestock diseases prevalent in the state may become a menace to interstate traffic or to the livestock industry in other states. Undoubtedly there have been in the past instances where states shirked the responsibility and said, "Let George do it"—meaning, "Let the United States Bureau of Animal Industry do it."

We consider the United States Bureau of Animal Industry the foremost organization of its kind in the world. No matter how good a state veterinary service may be, we must look upon the former as an organization that will render efficient and immediate veterinary service in times of emergency, as well as in general disease conditions, such as tuberculosis, Bang's disease, scabies, etc.

We can not help but feel, however, that it is to the interest of the Bureau, as well as to the state interests and the interests of the livestock industry, to offer more encouragement for the formation of well-organized state veterinary service. We are of the opinion that the federal government should provide definite standards for state organizations and that when a state complies with those standards the federal government should give adequate financial support on a prorated basis for such compliance.

Special federal legislation and United States Bureau of Animal Industry approval would be necessary before this kind of plan could be carried out, but such a procedure is not unattainable. Surely, from a national protective standpoint, the health of our live stock, which reflects itself in the health of the people, is just as important as are good roads. The Department of Agriculture matches dollars with state highway commissions in the building of state highways and gives financial support to state experiment stations and agricultural colleges. The Pitman-Robinson Act provides for financial aid to state fish and game commissioners through the biological survey. The United States Public Health Service also assists the various state boards of health when they meet their requirements. Such a procedure would not destroy state identity. We are of the opinion that it would result not only in benefit to the United States Bureau of Animal Industry, but also to private practitioners, and it would place state veterinary service on a solid basis.

When such action is taken, there is good reason to believe that state veterinary service and interstate regulations will become more uniform and that the veterinary profession will secure the added recognition to which it is entitled.

Increasing Food Production in Great Britain

The London correspondent for the American Medical Association writes that there are 2 million more acres under cultivation in England than before the present war began last year. Under normal conditions England imported 70 per cent of her food and now for the first time since earlier days, turns her attention to home food production on a larger scale. Prospects of making her population more nearly self-sustaining are bright.

From another source (*New York Times*,* June 15) comes a report that English farmers who will clear and till idle land are going to receive $20 per acre as a subsidy paid out of public funds. Those who plow up permanent pastures are to receive half that amount per acre. Although we have no information to the effect that these measures are now in operation, the fact remains that farming, not industry, is the salvation of nations with land to till and to produce the necessities of life.

*Quoted by Daily Digest, USDA.

But What About Poultry?*

CLIFF D. CARPENTER, D.V.M., M.S.
Fort Wayne, Ind.

THE SEVENTH World's Poultry Congress in Cleveland, Ohio, in 1939, with its publicity, its exhibition, its drama and its science, focused attention on the value of our poultry industry and demonstrated what can be accomplished when individuals from all branches of a single agricultural pursuit work toward a common goal. The combined result was the greatest exposition in the history of agriculture. The veterinary profession gave its best in both representation and activities to help make this eleven-day event, attended by more than 800,000 people, the complete success that it deserved to be. On Wednesday, August 2, officially designated by the Congress as AVMA Day, 350 veterinarians from 11 foreign countries and 37 states attended a special program which had been designed to demonstrate to the profession the industry's needs for an adequate veterinary service, and to issue a clarion call to that service to meet these needs.

Professor Rice, in his inimitable manner, has repeated here today that we face an obligation to the farmer which we must concede is not being met adequately. Further, he has declared that we are missing a golden opportunity, not only professionally, but financially.

The best scientific minds in our land, as well as the public, credit the veterinary profession with controlling successfully, for the benefit of the farmer and the consumer of agricultural products, such maladies as tuberculosis, tick fever, bovine infectious abortion, hog cholera, rabies, equine encephalitis, canine distemper, and others. In each of these the practitioner has played a heroic rôle.

*Presented before the second general session of the 77th annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

†Pathologist, Educational Department, Allied Mills, Inc.

VETERINARY RESEARCH HAS ADVANCED KNOWLEDGE OF POULTRY PROBLEMS, BUT PRACTITIONERS HAVE NOT DONE THEIR PART

But what about poultry? It is true, veterinary scientists have pursued the field of avian pathology in a commendable manner. In the past quarter of a century their researches have shown that such diseases as pullorum, fowl pox and laryngotracheitis and such parasites as coccidia, lice, roundworms and tapeworms need not exact the terrific annual toll formerly experienced by the poultry industry. But the practitioner has not taken his place in applying the science of avian pathology to his practice in the same proficient manner as he has in the control of other animal diseases.

Scientific findings in poultry diseases have been published broadly and have become governing laws with those farmers, particularly in the East and in the far western states, who make poultry their chief source of income. Perhaps 25,000 specialized poultry farmers today have accepted and applied these findings to the extent that the above-mentioned diseases no longer threaten their profits. In some states veterinarians who have specialized in the practice of poultry diseases have taken the lead in applying the science of avian disease control for these specialized farmers, but most of the work has been done by the owners themselves, or by laymen who, by training and experience, have become proficient in disease-prevention practices.

Although specialized poultry farming occupies a ranking spot in American agriculture, the total number of birds owned by specialized farmers is but a very small percentage of the total poultry population. Census figures disclose that 90 per cent of the poultry population of this country is kept on general farms—and usually in small numbers, from 75 to 300 birds each. This means, then, that the bulk of American poultry is but another economic unit of

our general farm-animal population. While this condition exists throughout the country as a whole, its significance is foremost in the great Midwest—from western Pennsylvania to the Rocky Mountains and from Minnesota to the Gulf. Census figures further reveal that chickens are kept in commercial quantities on 5½ million farms, and, since the bulk lies in the great geographic area mentioned, it is seen at once that the practice of poultry-disease control constitutes a general farm problem in the same manner as sheep, hogs, cattle and horses, and, because of its far-flung distribution, not a problem for the specialist.

Since this is true, does not the general practitioner then fail in his professional capacity unless he is qualified and willing to extend the same medical service to the poultry yard that he does to the sheep pen, dairy barn, horse stable, kennel and hog lot?

To place the entire blame for this situation on the shoulders of the general practitioner is unfair. It must be borne in mind that the commercialization of chickens and turkeys has developed by leaps and bounds. Raising poultry lends itself almost to overnight expansion as compared with larger farm animals. Likewise, the rapid development of the hatchery business is a partner to this situation. The hatching industry produces for sale nearly a billion chicks annually, selling at an average price of 10 cents each, and with a comparatively trifling initial purchase, a farmer may become a poultryman quickly, even without owning a single breeder or incubator. These same circumstances are not duplicated in any other phase of animal husbandry. The ready cash crop of poultry and poultry products has been attractive not only to the farmer, as an adjunct to his general income, but also to the housewife, who broods 500 chicks and maintains a laying flock of 200 hens from which often she derives her entire year's spending money.

Now, shall we accept both the obligation and opportunity to supervise and carry out the control measures for poultry diseases, in the same manner that we have other animals? It is a well-known fact that kennel owners and dog breeders were at one time the accepted authorities in preventing and controlling canine diseases. In like manner, because the veterinarian of yesteryear was not a general practitioner, but specialized in horse diseases, the lay specialist did a thriving business in the diseases of cows. Many veterinarians in those early days were "too busy" to treat cows, but the fact is that by their lack of training and application they were not qualified to compete favorably. Did we then become the custodians of bovine health by any means other than that of recognizing the need and preparing to meet it? Has it not been said for more than a generation that the lay quack would survive just as long as veterinarians could not offer a more scientific and adequate service?

Is not the poultry issue the same? True it is that, with legal protection, the general practitioner could do more poultry work, but that does not guarantee that he would be any better qualified. At first, this sounds like an indictment of the veterinarian, but this is not the intent. Unless, however, we are fair in our analysis of the present situation, we can not hope to correct it.

VETERINARY COLLEGES MUST PIONEER IN EXPANSION OF POULTRY PRACTICE

Where to begin? Thirty years ago, when veterinary practitioners determined to qualify for cattle practice, most of them attended every veterinary meeting possible, to secure the necessary experience to fortify their lack of training. It may be said of veterinary institutions that they, too, realizing the importance of the dairy industry to the farmer, gave as much time to bovine nutrition, management, anatomy, physiology, pathology and therapeutics as they did to equine. This change took place rapidly, and shortly thereafter we saw the general practitioner come into his professional own in this field.

Twenty-five years ago the veterinary colleges again responded in training students for the practice of small animals; the practitioners themselves took advantage of every available opportunity through meetings and clinics under the direction of vet-

erinary colleges and veterinary departments, as well as national, state and local veterinary associations, to become proficient in the practice of this important phase of veterinary medicine.

The challenging question today is, "Can we repeat with poultry?" If we can not, or do not, then we must ask whole-heartedly and without bias that state agricultural colleges train their poultry students or other specialized laymen to do that which the poultry industry needs most—an adequate disease-control service.

With the many facts concerning specific disease control known to the veterinary scientist, and to the specialized poultryman, our first effort, then, should be directed toward getting to the farmer a better application of this same knowledge and these same facts, by way of the general practitioner. It has been estimated that if the present known poultry-diease-control measures were put into effect promptly, the present annual mortality of 30 to 40 per cent could be reduced one half in one year. This would result in a saving of $100,000,000 a year to our farmers. However, known disease-control facts are not being applied, and the average circumstance is as follows: The farmer does not see the first sick birds, does not note the dropping off in feed consumption, and may not be alarmed by the gradual or sudden loss of egg production, until he suddenly discovers that one third to one half of his flock is sick. This would not happen in his dairy or, seldom at least, in the hog lot. He would be concerned at the first sign of disease; then, by calling his local veterinarian, further losses might be minimized or avoided.

But back to the poultry flock. When the farmer discovers that not 1 per cent but 20 or 30 per cent are affected, he fails to take into consideration, as do many veterinarians, that the situation which faces him is one that may have been brought about by poor breeding, unsound management practices or faulty nutrition. He recognizes that the flock is sick and calls upon his feed dealer or hatcheryman, who thinks in terms of medicating the flock. This sounds logical to the farmer. Regardless of the drugs he uses, the susceptible birds succumb, the losses finally stop, and the farmer believes that a pretty good job has been done for him. To say that such a procedure is unsound and costly is to put it mildly.

If, instead, the farmer calls his local veterinarian, and should he fail in his diagnosis, and likewise leave a bottle of medicine, the health of the flock has not been improved any more than in the other case. Does this not further delay the day when the poultry industry will be willing to leave the health of their flocks in our hands?

Our most urgent need, therefore, is to understand the husbandry of poultry, as we understand the husbandry of other farm animals, and build our practice on the basis of the application of scientific knowledge to poultry problems.

In training veterinary students to become general practitioners, it is just as urgent that they be proficient in poultry husbandry as in dairy husbandry, yet our colleges tell us that the present curricula already are overcrowded. Is this because five or six years is too short a time for adequate veterinary training? Is it because we have taken specialization so seriously that the veterinary student feels that poultry-disease knowledge and training are for the small handful of poultry specialists, or finally is it because of a lack of proper realization of the importance of poultry on the general farm?

Many practitioners graduated from college before poultry diseases were emphasized. Nevertheless, many practitioners who now have a fine small animal practice graduated before the diseases of small animals were featured. As their practices demanded it, they increased their proficiency through every available means.

Since most veterinary colleges, veterinary departments and state associations hold two or more meetings a year for practitioners, it seems that there is ample opportunity for practitioners to refresh themselves in poultry-disease science and practice, provided the programs are built to include this material in an adequate manner. In most cases, however, if poultry is included at all, it has been given a very

small amount of time right at the beginning of the meeting, or near the close, and experience has shown that either a lack of desire or opportunity results in but a small attendance at this section of the program.

The Poultry Committee of the AVMA, this year, made a survey in the midwestern states of Ohio, Indiana and Illinois, hopeful that thereby two purposes would be served: (1) to find out how much poultry practice is being done by the general practitioner in relation to the opportunities, and (2) to discover if there is a real desire on the part of general practitioners to become better qualified in handling this phase of a veterinary practice.

Two hundred and fifty general practitioners in each of the three states mentioned above received this questionnaire. Of this number, 211, or nearly 30 per cent, replied. Since there are approximately 1,500 general practitioners in these three states, the Committee feels that the sample taken was sizeable, and that fairly accurate deductions can be made from the answers submitted by these practitioners. Fifty-six per cent said that they had not attended a veterinary conference where poultry practice was featured since 1937 or before. Eighty-one out of the 89 who attended such conferences said they had received distinct helps which they had applied to their practices. Sixteen per cent said they had no poultry practice. Twenty-two per cent receive from 1 to 10 cents of every dollar from poultry, and 48 per cent indicated that their poultry practice produces about 10 per cent of their income. Only 5 per cent indicated that they did not have time for poultry practice, or that it was unprofitable.

An analysis of the poultry population in the counties of the three states covered by this questionnaire indicates that many general practitioners reporting very little or no poultry practice reside in areas richly populated with poultry. In contrasting manner, some veterinarians in general practice receive a good percentage of their income from poultry and do not have a higher than average poultry population. These analyses suggest that there is little relation between opportunity for poultry practice and its fulfilment.

The key question of this poultry survey was as follows: "If extension classes in poultry diseases for veterinarians only, were provided by your state college or university, would you make application for enrollment?" Two states said "yes" to the tune of 79 per cent of those returning the questionnaire. The third state replied 73 per cent in the affirmative, or 77 per cent for the three states.

PRACTITIONERS WANT TO LEARN MORE ABOUT POULTRY-DISEASE CONTROL, SURVEY SHOWS

Thus it can be said that the average general practitioner desires to increase his present knowledge of poultry-disease control. More than three out of every four returning the questionnaire not only indicated they would like to have such extension classes, but said they would write their state colleges when notified of the results of the questionnaire, asking that such classes be initiated. This is an encouraging discovery.

When these veterinarians were asked for suggestions concerning the organization of such classes, a large number requested that more emphasis be placed upon demonstrations and clinics, and less time spent on experimental work and theory. Some said: "Let the demonstrators be practical men who have conducted successful poultry practices." One veterinarian commented as follows: "Classes should stress practices and management procedures which will promote healthy birds. Medicinal treatments in poultry are, at best, of little help. The gullible poultryman has too often been 'taken in' by the 'beautiful' advertising of some commercial organizations." Only four veterinarians requested more laboratory work.

Quite a few practitioners said their greatest objection to poultry practice is that there is too much conflict with laymen. Four per cent indicated that the veterinarians themselves were to blame for not having a greater poultry practice. I wish to

read one veterinarian's comment in its entirety:

> With few exceptions, most veterinarians through training, experience and access to available information relating to poultry management and diseases, are capable of rendering a real service to the owners of poultry. However, it is my information that the territory of the average rural practicing veterinarian is over-run and thoroughly combed by extension experts, quacks, feed-store agents and others. I believe we, as veterinarians, have neglected to take care of this field of service, and as a result, like all neglected phases of veterinary medicine, other groups have taken over and established their programs.
>
> I also believe every veterinarian should make it a daily habit of working to overcome these encroachments by doing some educational work with the clients. An aggressive program of scientific competition should be prepared and established by the veterinarians, which would be suitable for the area to be covered.

Is this not a fair analysis and does it not suggest a rugged, worthwhile outline of procedure?

It is to the credit of the educational institutions in the three states surveyed that they gave assistance in helping the Committee secure this information in analyzing the returns, and offering a means of bringing to their constituents all possible help. The Poultry Committee offered in their annual report this year, among other recommendations, the following:

> That veterinary colleges and veterinary departments, in each of the 48 states, assisted by their state and district veterinary associations, conduct a detailed survey to determine:
>
> a) The amount of poultry practice being done by each registered practitioner.
>
> b) The number of veterinarians who would enroll in regularly scheduled extension classes for veterinarians only, if conducted by their state college or university.

The Poultry Committee further recommended that, when the proposed surveys have been completed, adequate arrangements be made by state institutions to offer extension instruction in poultry-disease control to graduate veterinarians only, and that such instruction include anatomy, physiology, pathology, parasitology, therapeutics and particularly nutrition, sanitation, management and breeding.

In addition, the Committee recommended that all state and district veterinary programs feature poultry papers, demonstrations and clinics of practical value. In making such recommendations, the Committee took action not without some precedent and experience. In the states of Michigan, Illinois and Iowa, among others, extension schools have been inaugurated, with a high degree of success.

It may not be necessary for each state to follow a set pattern as long as two fundamentals are accomplished: (1) that both veterinary departments and practitioners recognize that poultry-disease control is the problem of the general practitioner and (2) that definite means be instituted to assist general practitioners in securing necessary aids to better equip them to be of adequate service to the farmer.

But what about poultry? If the veterinary profession responds to the challenging issue of Professor Rice this morning, and the summarized presentation herewith, there can be but one answer to the question. We shall witness during the next few years practitioners taking their place in the field of poultry, as they have in other animal fields. We shall see not just the leaders of the poultry industry and the successful commercial poultrymen consulting veterinarians, but also the general farmer turning to his local veterinarian for guidance in maintaining a high rate of livability in his flock.

Should we, however, by our own lack of interest, or lack of opportunity to better equip ourselves, fail to meet this challenge, then we rightfully must remove all prejudice against lay assistance to the flock owner. It is imperative that the needs of the poultryman be served by trained professional men. The very nature of veterinary education and practice places the Doctor of Veterinary Medicine in the key position to serve in another great field of agriculture.

One of the economies brought about by World War II is the reduction of the number of pages in medical journals of the belligerent countries.

Ophthalmology in Equidae*

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ABOUT THREE YEARS ago the Department of Animal Pathology of the Kentucky Agricultural Experiment Station undertook a study of periodic ophthalmia in horses and mules. The primary purpose was to determine the cause, method of prevention and treatment of the disease. It seemed necessary to determine, as far as possible, the normal variations, the inflammatory changes and pathological lesions to which the eyes of horses are subject, and to differentiate between those which are symptomatic of periodic ophthalmia and those which are unrelated to the disease. To this purpose a detailed examination of the eyes of 2,415 horses and mules has been made and the findings recorded. Animals of all ages, as they are found on the breeding farms in this community, were represented. Besides these and farm horses and mules, a group of 50 city horses, one of 126 Army horses and one of 67 range-bred horses were examined. Of 2,121 animals in groups where all were examined, 8.3 per cent had periodic ophthalmia.

Observations made in these clinical examinations indicate that there is a considerable amount of variation and pathology in the eyes of horses. Many of these changes are in direct proportion to the age. Among animals being used for work not requiring keen vision, there is frequently found a high degree of defective vision, or even blindness in one eye, which had not been suspected by those in daily contact with the animals. Equine ophthalmology is not advanced sufficiently to differentiate between or classify inflammatory and noninflammatory changes in many cases. Some changes, as vitreous opacities in supposedly normal eyes, appear clinically similar to those in eyes having suffered periodic ophthalmia. These opacities may be sufficient to cause blindness in horses that have never been known to suffer the acute symptoms of periodic ophthalmia. These lesions warrant consideration and emphasize the importance of an examination of the eyes when one is passing on the soundness of any horse. Detailed examination is necessary because opacities of sufficient density or size to affect the sight may be present but not seen with the naked eye.

IRIDOCYCLITIS MOST COMMON CAUSE OF DEFECTIVE VISION IN EQUIDAE

An iridocyclitis is the most common cause of defective vision in Equidae. The symptoms and course of the disease called periodic ophthalmia have been recognized as primary inflammation in the iris and ciliary body. The important problem in equine ophthalmology is, therefore, a consideration of iridocyclitis. The latter term is used in this paper to anatomically describe periodic ophthalmia. There are indications to warrant the belief that there is a specific cause for the disease called periodic ophthalmia, but that iridocyclitis has other causes.

The following is a report of the methods we have used in a clinical study of equine ophthalmology with mention of the observations made and an attempt to interpret them. One should realize that the eye is a delicate structure, easily damaged by trauma, subject in some species more than others to primary disease and to complications from a general systemic disease. Frequently pathological changes are incompletely repaired and in some structures of the eye they have a great tendency to recur. The anatomy of the eye is such that it affords a better opportunity for a clinical study of variations and pathological changes, in many of its structures, than many other organs of the body.

*From the Department of Animal Pathology, Kentucky Agricultural Experiment Station. The investigation reported in this paper was conducted in connection with a project of the Kentucky Agricultural Experiment Station.

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Procedure for Eye Examinations

As in other physical examinations, some systematic procedure should be followed in eye examinations. It is advisable to include at least three steps, which are (1) naked eye examination with sunlight as a source of illumination and including palpation of tension, (2) examination by focal illumination with magnification and (3) examination with an ophthalmoscope. Where there is a brain or nerve lesion, the performance of the animal should be observed as there may be defective vision without recognizable changes in the eye. The horse should be observed under conditions or in surroundings with which he is not entirely familiar.

1. NAKED-EYE EXAMINATION

The normal procedure in examining the eye is to begin with a naked-eye examination of the external structures and appendages of the eye. Sufficient light for this purpose may be had by placing the horse just out of the direct rays of sunlight and facing an open outside doorway, or a window if it permits sufficient light. If in a box stall having a window, face the horse toward the window. Then, standing at arm's length in front of him, turn his head slightly from one side to the other so that the general appearance of one eye can be compared with the other. Observe the position and thickness of the lid; the condition of the conjunctiva, whether swollen or congested; the character of any secretion; the clearness and brilliancy of the cornea; and what can be determined of the aqueous, iris and lens. Anything suspicious that is seen is noted for more thorough examination.

The shape and position of the eyelid should be noted. With a decrease in the tension of the eyeball, as is common in periodic ophthalmia, the eyelid is not held in its normal position. The atrophy allows a pit to form in the lid over the eyeball and a notch to form in the margin of the upper lid. A notch in the upper lid does not necessarily indicate that there is a decreased intraocular tension because it is seen in the conformation of many normal eyes. Such a notch should be considered only with suspicion until a more complete examination is made. By comparing the eyes one can frequently detect that one eye is smaller than the other, even in cases where there are no other visible naked-eye lesions.

Conjunctivitis.—If a conjunctivitis is present one should determine whether the inflammation is: (1) associated with other diseases, as respiratory or digestive; (2) limited to the conjunctiva; or (3) involved with the uveal tract. If it is merely a conjunctivitis with possibly a keratitis and no other symptoms, the chance of its being periodic ophthalmia is not great. The cause is probably traumatic, a foreign body, or irritation from dust and wind. Because these cases may be accompanied by increased lacrimation and photophobia, and frequently recur on exposure to dust or bright sunlight after the symptoms have partially subsided, they are suggestive of periodic ophthalmia. The two conditions can be differentiated by a more complete examination.

Besides the changes in the eyelid and conjunctiva, the lesions which can be seen by the naked-eye examination are opacities or cloudiness of the cornea, cloudiness of the pupil from opacities beyond it, exudate in the aqueous humor and some cataracts. Some changes, such as slight cloudiness of the cornea, may pass unnoticed or be misleading in the examination with the ophthalmoscope if they have not been seen in the naked-eye examination. Other lesions observed in the naked-eye examination may be more thoroughly examined by later steps in the procedure.

Tension.—During an acute attack and following attacks of periodic ophthalmia there is always a tendency, depending upon the severity of the attack and the number of previous attacks, for the tension of the eyeball to be decreased. As previously mentioned, the lid fails to be held in its normal position due to the decreased tension and atrophy of the eye. Estimating the tension of the eyeball by palpation with the index finger on the closed lid over the eye has long been practiced and should be included in the examination, especially in cases suspi-

cious of periodic ophthalmia. In case of doubt as to tension, anesthetize the cornea and palpate directly upon it. Palpation should be carefully done to avoid injuring the cornea. By this procedure slight decreased tension is more readily evident than from palpating over the closed lid. A tonometer can be used on the cornea or sclera to actually measure the amount of intraocular tension. It gives quite accurate comparative readings but is not a necessity, as subnormal tension is quite readily recognized by palpation.

Decreased tension is a significant symptom in periodic ophthalmia and is important in the prognosis as well as the diagnosis. If the tension remains considerably decreased following an attack of periodic ophthalmia the prognosis is not favorable. In these cases recurrent attacks and blindness occur sooner than when the tension remains more nearly normal. In some advanced cases of chronic periodic ophthalmia in which the lesions remained unchanged for a long period, the tension remained quite normal. Only one case of hypertension of the eye in a horse has been encountered. This animal was blind in the opposite eye from what was apparently periodic ophthalmia. The hypertension may or may not have been due to periodic ophthalmia. A history of the case could not be obtained and nothing could be seen through the densely opaque cornea.

2. FOCAL ILLUMINATION

The next step in the procedure is to turn the horse to the darkest part of the stall or stable in such a position that rays of light from an external opening do not shine into the observer's eyes. A source of focal illumination, such as a vest-pocket flashlight, is then used. With the rays directed obliquely from different angles the clearness of the pupil, the lens and the structures anterior to it are observed. With this light small opacities and blood vessels in the cornea are brought out more distinctly than with natural light.

Some degree of magnification is frequently desirable with focal illumination to examine lesions in the conjunctiva, cornea, aqueous humor and iris. For this purpose and to observe the degree and promptness of the iris contraction to light, an otoscope, with the speculum removed, is used. A slit-lamp, which attaches to an ordinary battery ophthalmoscope handle, also is used. This furnishes a magnifying lens through which a narrow beam of oblique illumination is viewed.

Cornea.—It is essential to determine the extent of the structures involved in a keratitis. Structures besides the cornea will be involved in periodic ophthalmia. Localized opacities on the cornea suggest traumatism. However, localized opacities near the corneal margin, with vessels from the limbus supplying them, are occasionally seen in acute attacks of periodic ophthalmia. In acute periodic ophthalmia the cloudiness usually begins in the periphery, with the whole cornea becoming diffusedly cloudy; blood vessels may form the limbus. These changes apparently result from disturbed circulation and infiltration as a result of the iridocyclitis, rather than from the increased intraocular pressure as has been suggested. They are present in periodic ophthalmia, in which a decreased intraocular tension is typical even in acute attacks.

There may be no apparent change in the cornea in some cases of periodic ophthalmia. The external symptoms of some recurrent attacks may be limited to a slight degree of increased lacrimation, photophobia and contraction of the iris. In such cases it is necessary to consider the history and complete an examination of the inner structures of the eye. In these cases, as in many others, it is helpful to compare the findings in the questionable eye with the opposite eye, if the latter is normal. In some cases it may be necessary to repeat an examination after the acute symptoms in the anterior part of the eye have subsided in order to determine the extent of the symptoms or lesions.

It has been said that the white or faint bluish line at the corneo-scleral margin of the cornea, on the temporal and nasal side, increases in width following attacks of periodic ophthalmia. This so-called ring is wider in the temporal than the nasal side.

It is absent or very narrow in young animals and increases in width with age. It varies in width up to about 2½ mm. and apparently is not wider in eyes having had periodic ophthalmia than in many normal eyes. The line frequently becomes blurred by diffuse peripheral cloudiness of the cornea in acute attacks of periodic ophthalmia. Following the attack it appears in its former width. In chronic periodic ophthalmia, and especially after blindness develops, opacities of the cornea, to an extent which may include a large part of it, do develop. These do not resemble a wide corneo-scleral ring. One should look for other symptoms which are characteristic of the disease.

Aqueous Humor.—The aqueous humor frequently becomes turbid in an acute attack of periodic ophthalmia. The degree of turbidity is in proportion to the severity of the attack. In a mild acute attack there may be no apparent change in the aqueous. Often the cloudiness of the cornea hides this turbidity until it settles in a mass to the lower part of the anterior chamber a few days after the beginning of the attack. The aqueous is best examined with the narrow beam of a slit-lamp, although after the precipitate forms, it can be distinguished with any focal illumination if the cloudiness of the cornea is not too great.

Hypopyon may of course be present in the posterior as well as the anterior chamber and has a great tendency to cause adhesions between the iris and the lens. This hypopyon, which consists largely of white blood cells and some epithelial cells, is occasionally a reddish color due to the presence of red blood cells.

The exudate in the aqueous humor is due to inflammation of the iris and ciliary body, both of which are usually involved simultaneously. Such inflammation and exudation into the aqueous is seen in conditions other than cases of specific periodic ophthalmia. It appears without recurrence in experimental injection of such innocuous material as sterile distilled water into the vitreous chamber. Hypopyon and the other symptoms considered classical of periodic ophthalmia have been observed in three suckling foals. One of these has been followed for more than one year and another for more than two years. In neither of these has there been a recurrence of symptoms. Lacrimation, photophobia and exudate in the aqueous also are seen in horses suffering from some general systemic disease, without a recurrence of these symptoms. Prognosis in this type of case should be made with some reservation, as there is a great tendency for the acute symptoms of iritis or iridocyclitis, of different or unknown etiology, to recur. It would seem that all cases with the recognized acute symptoms of periodic ophthalmia, whether or not they do recur, are not due to one specific cause.

Iris.—The size of the pupil, irregularities in the pupillary margin and the reaction of the iris to light should be observed. By comparing the size of the pupil with that of a normal eye in the same light, and by observing the promptness and degree of iris movement with changes in the intensity of light, an estimation of the condition of the iris can be made. These movements are seen plainly through an otoscope by increasing and decreasing the intensity of light. Movement of the iris may be limited by adhesions, by congestion, by nerve lesions or blindness. Unsymmetrical dilation following the use of atropine means that adhesions are still present. Tears in the margin of the iris, as a result of previous adhesions to the lens, are easily seen with focal illumination. Frequently pieces of black pigment torn from the iris in previous adhesions can be seen on the anterior capsule of the lens. A cloudy pupil, with no changes anterior to it, is caused by opacities of the lens or vitreous humor. An ophthalmoscope may be necessary to locate such opacities.

3. OPHTHALMOSCOPIC EXAMINATION

An ophthalmoscope is a necessary part of the equipment and with a little practice one can obtain the advantages which it affords in eye examinations. This instrument is used especially to examine the media—cornea, aqueous, lens and vitreous—and the fundus—retina, optic disc and choroid. An erect picture of the fundus,

magnified about 14 times, is obtained. Dilation of the pupil with such agents as atropine is unnecessary unless the iris is abnormally contracted due to inflammation or adhesions.

It is advisable to systematically examine all the structures. One method is to begin with an examination of the media and iris, using a convex lens of 5D in the aperture, holding the instrument about 12 in. from the horse's eye. With the light directed through the pupil any opacities of the media will appear as gray or dark objects. The eye is then gradually approached to within 2 in. with the ophthalmoscope. When this distance is reached, it is advisable in order to follow the movement of the horse and to protect yourself if the horse throws his head, to extend and rest a finger of the hand holding the ophthalmoscope, on the face of the horse. As the eye is approached, stronger convex lenses are placed in the sight hole of the ophthalmoscope in order to examine in detail any changes of the media or iris by focusing directly upon them. Stronger convex lenses are required to bring the more anterior parts into focus. Many vitreous opacities will be in focus with a convex lens of 8D, while a convex lens of 20D will focus upon the cornea.

The strength of lens required by an observer to bring any part into focus depends upon the refraction or correctness of his vision, whether or not he relaxes his accommodation and the refraction of the horse's eye. The first two possibilities may be variables in different observers. Because they will be constant in an individual, he can reach certain conclusions as to the location of opacities by knowing which lens he requires to distinctly focus on a certain part of the horse's eye.

The location of opacities in the media can be determined by noting the direction in which they are displaced in relation to the pupils as the observer moves his head from side to side. When they remain in the same location in the pupil, they are in the plane of the iris and, therefore, near the anterior capsule of the lens. When they appear to move in the opposite direction to the observer's movement, they are anterior to the iris; when in the same direction, they are posterior to the iris. The greater the rate of movement appears to be, the farther they are from the plane of the iris. Whether opacities are in the cornea or aqueous can often be determined by viewing obliquely. Their location also can be estimated by noting the strength of the convex lens in which they are in focus.

Lens.—Opacities on the anterior capsule of the lens and cataracts involving a large part of the lens can be seen with the naked eye. Other opacities can be seen only with the ophthalmoscope. The type of the latter which have been seen most frequently are: (1) Dots and rather transparent, small areas on the anterior capsule. (2) White specks located in concentric lines at the temporal or nasal sides. Neither of these two types disturbs the vision or shows much tendency to advance. (3) Diffuse posterior capsular cataracts, which appear as deposits of exudate on the posterior capsule; they may be of sufficient size and density to disturb the vision. (4) Posterior cortical cataracts, which appear star-shaped near the center of the lens. (5) Cortical cataracts which resemble cracks in glass within the lens. With the exception of the diffuse posterior capsular cataract and the cortical types, these cataracts do not appear to have any relation to periodic ophthalmia. They were all seen in cases without a history of acute periodic ophthalmia and were found to be more common in old than young animals.

Occasionally a small streak, apparently congenital, is seen within the lens. Other congenital defects seen in the lens were total cataract and luxation.

After a horse reaches the age of 10 years, there is a tendency for hardening of the lens to develop. This condition is manifested by the appearance of concentric rings in the outer nasal and temporal sides of the lens.

Posterior capsular cataracts, cortical cataracts and gray spots and streaks on the anterior capsule are seen in periodic ophthalmia. They occur late in the course of the disease and usually the entire lens is

eventually involved. The lens may become opaque in a very short time. One eye, which was examined previous to an attack of periodic ophthalmia, was examined at two-week intervals following the attack. Ten months after the only acute attack which the eye suffered, the lens had become entirely opaque 14 days after an examination had shown it to be normal. Luxation of the lens, which may result from periodic ophthalmia, occurs after cataract has developed.

Vitreous.—Defective vision in Equidae is, no doubt, most commonly caused by vitreous opacities. They are the most constant lesions in chronic cases of periodic ophthalmia. However, many appear to have no relation to an inflammatory process. They occur either floating or fixed and in various forms, such as specks, threads, clouds of dust, diffuse dust-like particles, filaments and membranes.

Those which appear as specks less than pin-head in size, scattered sparsely through the vitreous, have a definite correlation with age. They were seen in 15 per cent of the sucklings and 26 per cent of the yearlings, and they increased with age until few aged animals did not have these or other less common types of vitreous opacities. They are not of sufficient size or number to affect the vision and appear to have no relation to inflammation within the eye.

Opacities in the form of fine threads, varying in length up to one half a disc in diameter, are less commonly seen. They were seen in periodic ophthalmia only when accompanying other forms of opacities after the disease had been in progress for some time. They were seen in eyes without a history of acute attacks of periodic ophthalmia and in symptomatic ophthalmia. They are often floating and may be of sufficient density and extent to cause blurred vision. In young foals one commonly sees remains of the hyaloid artery appearing as a single long thread or filament attached to the lens, to the region of the optic disc, or floating freely in the vitreous. They occasionally persist in mature animals.

Small specks, called dust when in considerable numbers, are frequently seen gathered into a more or less dense mass resembling a cloud. We have seen these clouds in chronic cases of periodic ophthalmia, following experimental intravitreous injection, and frequently in cases where there has been no history of ophthalmia. They are usually in the upper half of the vitreous chamber. They occur less commonly than the speck form and more commonly in mature than younger animals.

Diffuse dust-like opacities are most commonly seen in and following the first acute attack of iridocyclitis (periodic ophthalmia). The fundus of the eye will appear cloudy through such opacities. As previously mentioned, vitreous opacities are among the most constant lesions in periodic ophthalmia. Early in the course of the disease the vitreous may be cloudy and there may be definite opacities difficult to see. In the examination of one yearling with supposedly normal eyes no definite opacities could be seen, although the vitreous was cloudy. About six weeks later, after being shipped from Kentucky to Nebraska, he had his first acute attack of periodic ophthalmia. On his return to Kentucky, which was three months after the first examination, the vitreous was filled with diffuse dust-like particles.

The vitreous opacities which most definitely impair the vision appear as filaments and membranes. The filamentous form, which is usually floating, may be scattered unevenly through the vitreous, but very often appears as a more or less dense curtain hanging from above. The more dense membranous type may be mistaken for a detached retina. When dense, these opacities cause the pupil to appear cloudy in a naked-eye examination. Occasionally the so-called cyclitic membrane, which extends out into the vitreous from the ciliary body, can be seen without magnification. It passes in the anterior limits of the vitreous, over the posterior capsule of the lens.

From our observations it would seem that in the first acute attack of periodic ophthalmia diffuse dust-like opacities form in the vitreous. In some cases at least, there may be a clouding of the vitreous without visible opacities, before the first acute external symptoms are seen. After the acute

attack has subsided dust-like opacities tend to gather and remain as a cloud in the dorsal part of the chamber. With each acute attack, diffuse dust-like opacities form and the opacities which remain between attacks become more dense. Filaments eventually form and become more dense, until finally there are dense, membranous opacities and the vision is permanently defective. Frequently the vitreous opacities gradually increase and blindness develops without a recurrence of the acute symptoms of the first attack.

There is also a chronic form of ophthalmia, with clinical and histological lesions similar to periodic ophthalmia, that has never shown acute external symptoms. Animals affected with this form may have suffered mild attacks which could easily pass unobserved. The chronic symptoms or even blindness can develop without the classical acute symptoms of periodic ophthalmia—conjunctivitis, increased lacrimation, photophobia and hypopyon— having been observed. In other cases, after the iridocyclitis has caused filaments and membranes to be formed in the vitreous, they suffer the first acute attack of ophthalmia. The vision has already become defective due to the vitreous opacities or other lesions of chronic ophthalmia and, in such cases, blindness often follows soon after the first acute external symptoms have disappeared. This course of ophthalmia is more common in aged than young horses. On some farms with a history of a high incidence of periodic ophthalmia for many years, most of the cases of this type have been in aged horses.

Fundus.—After the media and iris have been explored the fundus of the eye—retina, choroid and optic disc—should be examined. For this examination the ophthalmoscope should be held within 2 in. of the eye of the horse. If the eyes of both the observer and horse are of normal refraction, which causes the image to be focused exactly upon each retina, the observer should see the fundus most distinctly with a zero lens. However, until an observer learns to relax his accommodation, he will require a concave lens up to about 3D to see the fundus of the normal eye distinctly. If the observer knows which lens he requires to see the fundus of a normal eye distinctly, he can estimate roughly the error of refraction, that is, whether vision is normal, near-sighted or far-sighted. A concave lens for a myopic or near-sighted eye and a convex lens for a hyperopic or far-sighted eye are required for the observer to see the fundus distinctly.

A retinoscope and trial lenses are necessary to accurately measure errors in refraction. This technic will not be considered here, but we wish to point out that we have seen very few horses in which the error in refraction was great enough to affect the performance. It would be advantageous for a veterinarian to be able to refract an eye, as horses are occasionally suspected of being either near-sighted or far-sighted. The technic is not difficult. One might expect to find cases of correlation between errors in refraction and the performance of the horse by observations with horses that are being used for racing and jumping. The owners of some racing stables have been so convinced by an optometrist who did detect errors in refraction. Correction was attempted in some of these cases by having the horse wear correcting lenses placed in a hood. Our experience indicates that most horses are slightly far-sighted.

In an examination of the fundus with an ophthalmoscope the choroid is seen through the normally transparent retina. When detached, the retina appears as a dense, floating opaque membrane. It atrophies and its structure becomes disorganized after being detached. Viewed through an ophthalmoscope it may then appear similar to vitreous membranes. If the vitreous or other opacities do not completely obscure the fundus, one may wonder why these cases are totally blind, since a detached retina can not be distinguished.

By looking horizontally through the pupil of the normal eye with an ophthalmoscope, one can see the tapetum lucidum, varying in color between green and straw and stippled with dark dots and dashes. Dorsally and to each side of the tapetum lucidum the fundus is mottled with areas of dark pigment. By looking lower on the fundus

the quite distinct change to the dark slate-color tapetum nigrum is seen. Just within the tapetum nigrum and slightly to the temporal side is located the optic disc, which is an uneven tone of light red. Emerging near the periphery of the disc are the small cilio-retinal vessels. These are from one to 1½ disc diameters in length on the nasal and temporal sides and about half as long above and below the disc. Arteries and veins can not be differentiated.

There is considerable normal variation in the pigmented epithelium and layers of the choroid around the optic disc. If these layers do not come up close to the optic nerve, the sclera shows through as a white ring partially or completely surrounding the optic disc. They may end at a variable distance from the nerve, leaving irregularly shaped, light-colored areas adjacent to the disc.

Other variations and lesions of choroiditis are most commonly seen in the peripapillary region of the tapetum nigrum of horses. These changes consist of: (1) Red streaks or areas in which the network of choroidal vessels is seen through the thinly pigmented epithelium. (2) A red cast out from the disc, which may reach up into the tapetum lucidum. This red cast appears to be on the surface of the choroid causing the nigrum to be reddish brown. There is no apparent structural change of the lucidum in these areas. (3) Small, discrete spots of degeneration, in which the red choroid or white sclera show. (4) Large, depigmented patches with well-defined borders. Their background of white or green is dotted and mottled with black pigment; choroidal vessels may be seen in them.

All these changes appear to be of a benign nature and do not cause vitreous opacities or perceptible disturbance of vision. It can not be said that they are seen more commonly in eyes of animals having periodic ophthalmia than in those which never develop the disease. There would seem to be no justification in expecting an animal with such lesions to develop periodic ophthalmia. However, in one group of 120 horses, of which 26 had periodic ophthalmia, there was also an extremely high incidence of these choroid changes. Seventy-seven of the 94 animals which had no history or symptoms of periodic ophthalmia had one or more of the types of choroid lesions described. The fundus could be seen in 14 of the 26 animals that had periodic ophthalmia. Of these there were similar choroid lesions in 10 and none in 4. Whether there was a common cause in this high incidence of periodic ophthalmia and of choroiditis or whether the choroiditis predisposed to later attacks of periodic ophthalmia is unknown, since but one examination has thus far been made.

Evidence of the development of choroiditis is not commonly seen with the ophthalmoscope in the course of periodic ophthalmia, although lesions in the fundus may be hidden by the opacities of the media. Papillitis, seen as a haziness of the optic disc, more commonly follows the symptoms of iridocyclitis. The structure of the disc may become indistinct, and beginning of detachment of the retina, which is seen as opaque rays projecting from the optic disc, apparently develops as a result of infiltration of the optic papilla.

Progressive choroiditis, which we have seen, was of a diffuse type. There was no sharp line of demarkation surrounding the depigmented patches. In these areas the gray deposits of exudate, the red, green or white of the underlying structures, and the mottling of black pigment were constantly changing and spreading over the fundus. The vision was affected due to involvement of the retina and there was no increase in vitreous opacities or other symptoms of periodic ophthalmia.

Both faint and definite opaque nerve fibers, apparently normal variations, are often seen on the temporal and nasal side of the optic disc. These cause a blurring of the margin of the disc, which should not be mistaken for an infiltration, because the remaining structures of the disc are quite distinct. With lesions in the brain or optic nerve, the optic disc may show either edema or atrophy. Immediately following exercise the optic disc shows increased redness.

One foal, which was blind at birth, had

a very pale optic disc and no visible retinal vessels. Autopsy revealed hydrocephalus, and hypoplasia of the optic nerves. A weanling which had shown a skin hypersensitiveness for several months suddenly became blind. At this time he had extremely dilated pupils, diffuse choroiditis and atrophy of the optic nerve. The choroiditis became more extensive during the several months which he was kept. On autopsy an abrupt, decided constriction of one optic nerve within the optic canal and a gradual constriction of the other from the chiasma to the eyeball were found. There were no symptoms or lesions of periodic ophthalmia. This is the only case we have seen with any similarity to nutritional blindness in bovines.

Conclusions

The symptoms of periodic ophthalmia are due to an inflammation of the iris and ciliary body. While the acute external symptoms—conjunctivitis, increased lacrimation, photophobia, keratitis and exudate in the aqueous—are frequently present, diagnosis of iridocyclitis is positive with the presence of (1) contracted pupil, with decreased iris reflex and resistance of the iris to mydriatics; (2) vitreous opacities; and (3) decreased intraocular pressure. All the latter symptoms are usually present.

Other structures of the eye are involved by extension or by change in the physiological functioning of the eye. The optic papilla, retina, lens, choroid and cornea are thus involved in later stages of the disease. Diagnosis of questionable cases of chronic iridocyclitis can most frequently be made on the basis of the presence of certain types of vitreous opacities and decreased intraocular pressure. Other lesions which most commonly accompany these symptoms are iris adhesions or tears, cataract, papillitis and detached retina.

Observations indicate that there are at least four types of iridocyclitis, with symptoms and lesions similar to so-called periodic ophthalmia, which may be of different causes. These are: (1) Primary iridocyclitis. It is characterized by acute, recurring attacks and is seen more commonly in young and middle-aged horses. If periodic ophthalmia proves to be a specific disease it will probably be this type of case. (2) Chronic iridocyclitis. The external symptoms of acute attacks may be unobserved or occur late in the course of the disease. The course and lesions in these cases indicate that they are a chronic form of the disease known as periodic ophthalmia. (3) Symptomatic iridocyclitis. This occurs as a complication of some other primary disease. (4) Traumatic iridocyclitis. In the last two types, acute symptoms typical of periodic ophthalmia occur. Lesions may remain, following the acute attacks in these cases, but recurrences of the acute symptoms are less frequent than in primary iridocyclitis. There is, however, always a tendency for a recurrence in any iridocyclitis, depending upon the severity of the attack and the remaining lesions as well as the cause. Symptomatic iridocyclitis should be suspected with accompanying general symptoms. The history, evidence of injury, or course of the attack are usually sufficient to indicate trauma. The one occasion in which a high incidence of choroiditis was present in a group of horses, which also had a high incidence of periodic ophthalmia, may indicate another cause of iridocyclitis or simply add to the symptom complex of the disease called periodic ophthalmia.

De-aerating Process Retains Vitamin C Content of Pasteurized Milk

A method to retain the full vitamin C content of pasteurized milk, by taking the air out of it, has been reported by Cornell University investigators, according to *Pathfinder* (Jan. 11, 1941).

The de-aerating process will cost 11 cents per 1,500 quarts. A quart of de-aerated pasteurized milk has a vitamin C content equivalent to a whole orange, while the vitamin C loss in ordinary pasteurized milk makes a quart equivalent to a slice of orange.

Gastrointestinal Parasites of Sheep and Their Control*

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IT IS WELL KNOWN that the incidence of disease increases with the increase of our population. This is especially true as regards disease due to parasites. As long as our live stock grazed on virgin soil, having access to rather extensive range, we had virtually no problems in so far as parasites were concerned. However, with the increase in livestock production along with the advent of comparatively small farms, with their permanent pastures, parasites became a problem of major importance.

The parasites inhabiting the gastrointestinal tract of sheep probably cause a greater economic loss to the sheep industry than all other diseases of this species of live stock. The control of sheep parasitism constitutes the biggest problem in ovine practice and our profession must give considerable attention to it.

No domesticated animal suffers as severely from intestinal parasitism as do sheep. While cattle and sheep harbor alike over 50 species of nematodes, representing 30 genera, there is a marked difference in their susceptibility. This may be due partly to the close browsing of sheep which facilitates the ingestion of the infective agents of these parasites. Their gregariousness may be another factor, but whatever the explanation, the fact remains that if cattle and sheep are pastured on the same area and a parasite infective to both hosts is present, the number found in sheep will be considerably greater than in cattle.

There are no symptoms of intestinal parasitism in sheep that can be considered characteristic. The same symptoms may be due to any number of causes. Emaciation, anemia, lameness, diarrhea, and edematous swellings in various locations are all indicative but not diagnostic of intestinal parasitism. The finding of worms or their ova and larvae in the feces indicates the presence of these species, but the severity can be judged accurately only by an autopsy.

In conducting an autopsy to determine the severity of parasitism and the species present, several important factors should be taken into consideration. Some species of parasites inhabiting the intestinal tract of sheep are readily seen and there should be no great difficulty in locating them. This group includes the large stomach worm (*Haemonchus contortus*), the tapeworm (*Moniezia expansa*), the nodular worm (*Oesophagostomum columbianum*), the large-mouthed bowel worm (*Chabertia ovina*), and the whipworm (*Trichuris ovis*). There are several species, however, that may be overlooked, including those belonging to the genera Ostertagia, Cooperia, Trichostrongylus and Nematodirus. These species are very small and thread-like worms and careful examination is required to locate them. In most instances it is necessary to make scrapings of the mucosa of the stomach and small intestine and place these scrapings in a glass dish partly filled with water. Examination of the scrapings against a dark background will usually enable the operator to see the parasites.

Sheep are affected by many kinds of parasites, both external and internal, but the most destructive and the ones causing the most economic loss are those inhabiting the digestive tract.

The important species found in the gastrointestinal tract of sheep may be listed as follows:

Abomasum: *Haemonchus contortus, Ostertagia circumcincta.*

Small intestine: Trichostrongylus spp., Cooperia spp., Nematodirus spp., *Bunostomum trigonocephalum, Moniezia expansa.*

*From the College of Veterinary Medicine, The Ohio State University; presented before the Section on General Practice at the 77th annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

Large Intestine: *Chabertia ovina, Oesophagostomum columbianum, Trichuris ovis.*

While the above-mentioned species do not include all of the parasitic forms inhabiting the gastrointestinal tract of sheep, they constitute the major problem, at least in the eastern part of the United States, and are the ones the veterinarian must attempt to control.

The life histories of the aforementioned species, with the exception of *M. expansa* (tapeworm) and *T. ovis* (whipworm), are quite similar and the following description will apply in a general way. The variations from this typical description will be mentioned subsequently. The female worms deposit ova in the intestinal lumen and they are passed out with the feces. After a brief incubation period the ova hatch into larvae, which must undergo two moulting periods before they are infective to their host. The infective larvae are then ingested by sheep either in the food or water. In most instances infection occurs on pasture where sheep are grazing. After ingestion the larvae migrate to their respective locations in the host and develop to the adult stage. According to experimental data, this life cycle requires as a minimum 22 days, although some investigators have experimentally completed the life cycle in 17 days. A knowledge of the length of time required to complete the life cycle is quite important, especially if a systematic control program is attempted.

The above description of the life cycle will apply to most of the species inhabiting the gastrointestinal tract of sheep, but there are variations in some of the species that bear mention. The larva of the *O. columbianum* (nodular worm), after reaching its natural habitat in the intestine, burrows into the mucosa and penetrates to the surface of the muscular layer. The body reacts to the presence of the larval worm by forming whitish cysts, which may reach the size of a pea. After a varying length of time, the larval forms leave the cysts and develop to the adult stage in the lumen of the intestine. In many instances these cysts, instead of subsiding, become infected with bacteria, and permanent nodules result.

The larva of *Ost. circumcincta* (medium-size stomach worm), after being ingested and reaching the abomasum, burrows into the mucosa, causing hemorrhage and some nodule formation. In the adult stage it is found free on the mucosa of the abomasum.

T. ovis (whipworm) is infective to its host in the form of embryonated ova. This species does not hatch into larvae outside the body of the host, but remains within the egg membrane. It does not have the ability to change its location except in a passive manner by drainage or being carried by vectors.

The *M. expansa* (tapeworm) requires an intermediate host to complete its life cycle. Stunkard[1] found that when mites of the genus Galumna ingest the eggs, they hatch in the intestine of the mite and develop in the body cavity. Lambs become infected very early in life by ingesting these mites while grazing.

The Nematodirus spp. differ from the other Trichostrongylidae in that the ova do not hatch on the development of the first larval stage. Both first and second moults occur within the ova. Frequently these ova do not hatch for a considerable length of time and may survive up to 20 months.

CONTROL

While it is essential that the veterinarian know what species infect sheep, their location in the host and the life cycle, the main problem concerning the practitioner is methods of control of these parasites. The problem of control may well be considered from two standpoints: management and anthelmintics.

Management. — Management should be considered in terms of two periods in so far as lambs are concerned, namely: the pre-weaning period and the post-weaning or pasture period.

Certain practices are necessary in order to bring lambs up to weaning time with a minimum of parasitism. In work conducted by the Department of Veterinary Research, The Ohio State University, the

[1]Stunkard: Sci., lxxxvi (1937), 2231, p. 312.

following system was established with gratifying results.

The lambs were held in the barn at all times up to the weaning period. The dams were kept separate from the lambs during the day and were allowed with them only for nursing periods. The wether lambs were allowed to run with the dams at all times, to serve as a control of parasite infection. For the past five years we have followed this plan and have been able to rear lambs to the weaning period with practically no parasite infection, while the control wether lambs, kept with the dams, revealed a high incidence of infection. This practice can be established on the average farm with a minimum of effort and expense and will enable the sheep owner to place his lambs on pasture, with a minimum of parasite infection.

At weaning time the lambs should be placed on a pasture separate from adult sheep, if possible, and preferably on a pasture that has not been grazed by sheep for at least 18 months. Our investigations indicate that after a period of 18 months very few of the strongylid larvae survive.

If possible, it is advisable to change the pasture area several times during the pasture season. Many larvae are destroyed during a two- or three-week interval if they are unable to reach their host. Large sheep pastures may be divided into smaller areas by temporary fences, which will allow rotating at two- or three-week periods during the grazing season.

During the past five years we have followed the above plan of managing sheep for parasite control and, without the use of anthelmintics, have controlled the incidence of parasites and sustained no losses from parasitism.

Nutrition plays an important part in the control of parasitism in sheep. In many instances lambs are not able to withstand the ravages of parasitism on pasture alone, without the aid of additional grain feeding. Well-nourished animals are much more resistant to parasitic invasions than are animals in poor condition, and even if worms do establish themselves their effects are less noticeable.

It is important to supplement pasture grazing with a grain mixture. At the Ohio station we use a grain mixture to supplement pasture grazing and have had excellent results from a standpoint of weight gains. Table I will illustrate the desirability of this type of program.

TABLE I—Comparative Gains in Weight

GROUPS	TYPE OF FEEDING	
	PASTURE	PASTURE AND GRAIN
No treatment	0.2	16.4
Copper sulfate	3.5	19.9
Copper sulfate and nicotine sulfate	4.5	20.4
Sodium arsenite	3.7	19.6
Tetrachlorethylene	5.4	21.6
Nicotine sulfate	2.5	18.9

Anthelmintics. — While the gastrointestinal parasites of sheep may be kept under control by a system of management, it is seldom practical to depend upon this alone, as many flock owners are forced to use permanent pastures. For this reason the use of an efficient anthelmintic is helpful in a control program and should be employed as an adjunct to management.

Medicinal treatment for the removal of parasites has been employed almost entirely during the grazing season. Little consideration has been given to the treatment of adult sheep during the winter season. Our investigations have shown that these adult sheep serve as a carry-over of parasite infection and readily spread infection when placed on pasture; they also serve as a source of early infection to the spring lambs. In any system of control of gastrointestinal parasites, this important factor should not be neglected. Efficient anthelmintic treatment, therefore, should be applied during the grazing period and during the winter period.

The use of anthelmintics in sheep and cattle creates a problem somewhat different from that encountered in other domestic animals because there are so many different species of parasites inhabiting the digestive tract of ruminants. It is

TABLE II—Efficiency of Various Anthelmintics (1937)

12 Animals in Each Lot	Average Number of Parasites Per Animal					
Anthelmintics (3-Week Intervals)	Haemonchus	Ostertagia	Small Trichostrongyles	Oesophagostomum	Monieza	Trichuris
Untreated	1,349	209	2,507	73	9	15
Copper sulfate	766	155	1,825	14	2	6
Copper sulfat e—nicotine sulfate	107	162	1,320	21	12	17
Sodium arsenite	230	180	2,176	16	2	10
Tetrachlorethylene	57	24	1,519	14	8	14
Nicotine sulfate	656	204	1,594	28	8	16

TABLE III—Efficiency of Various Anthelmintics (1938)

12 Animals in Each Lot	Average Number of Parasites per Animal			
Anthelmintics (3-Week Intervals)	Haemonchus	Ostertagia	Oesophagostomum	Trichuris
Pasture and no treatment	416	1,060	54	24
Pasture, grain; no treatment	447	925	10	12
$CuSo_4$ and nicotine	39	608	7	10
Tetrachlorethylene	68	278	13	9
$CuSo_4$ and nicotine alternated with T-lene	83	410	13	14
$CuSo_4$ and nicotine alternated with T-lene (2-week intervals)	3	401	2	10
Kamala and nicotine	1,804	1,686	10	13

hardly to be expected that any one medicinal agent will be equally effective in removing all of these species. Thus, the problem is to find an agent that is highly effective against the most injurious species and of at least some value in removing other less injurious forms.

When to administer the anthelmintic and how often to give it must be determined. Since the greatest injuries from intestinal parasites are produced in lambs, especially during the grazing season, this season is the most important time to use anthelmintics. Usually anthelmintic medication is given every 21 days during the grazing season. This practice is based on the theory that the life cycle of most of these parasites requires 22 days. Gordon[2] recently showed that immature forms of some of the species inhabiting the intestinal tract of sheep are not affected by anthelmintics to the extent that the mature worms are. This, no doubt, will explain some of the apparent failures that have been encountered. In Ohio we have treated at 21- and 14-day intervals, and better results were obtained by the latter method.

In choosing an anthelmintic one should consider its efficiency, cost, ease of administration and effect on the host. Many preparations have been used for the removal of gastrointestinal parasites in sheep, but those that have given the most satisfactory and consistent results are tetrachlorethylene and combined copper sulfate and nicotine sulfate. The former is more expensive but requires less time to administer. Our results for two successive seasons are listed in tables II and III.

Little consideration has been given to the elimination of intestinal worms from sheep during the winter period. If an attempt is to be made to control infection of lambs

[2]Gordon: Australian Vet. J., xv (1939), 2, pp. 57-66.

on pasture, the winter carry-over in adult sheep should be reduced to a minimum. This will aid in keeping pasture infection at a low level, especially during the early weeks of grazing.

During the winter period of 1938-1939, one of our staff* conducted an investigation to determine what results could be obtained by treatment at regular intervals. The flock was divided into two groups, one group receiving 5 cc. of tetrachlorethylene every 21 days, while the other group received no anthelmintic medication. At the end of the winter period, these animals were slaughtered and an examination was made for intestinal parasites. The results, recorded in table IV, were gratifying. The investigation showed that there is a considerable carry-over of infection in adult animals during the winter period and that this infection could be largely eliminated by treatment at regular intervals.

TABLE IV—Anthelmintic Medication of Adult Sheep During Winter Season

PARASITE	5 CC. TETRACHLORETHYLENE EVERY 21 DAYS	
	TREATED	UNTREATED
Haemonchus	0*	635*
Ostertagia	0	469
Trichostrongylus	97	450
Cooperia	2	44
Nematodirus	0	0
Bunostomum	26	13
Oesophagostomum	17	10
Trichuris	0	0
Moniezia	0	0

*Average number of worms per animal.

CONCLUSIONS

The control of gastrointestinal parasites of sheep can not be accomplished alone, under practical conditions, by either rotation of pastures, nutrition, anthelmintic medication, or any other one factor. The best plan is to employ all of the above factors to the extent permitted by conditions present on the farm.

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Farm Relief and Parasites

Although there is no statistical record to back up the innuendo, veterinarians who circulate daily among our live stock will agree that the parasites of domestic animals cost the farmers of the United States a great deal of money, perhaps more than they can ever hope to receive for farm relief from the government. And therein lies the best argument for developing a more complete veterinary service.

As far as the main infections are concerned, the American farmers are happily situated. The regulatory services of the federal and state governments, with the help of local practitioners, keep down sweeping contagions. But the parasites, and the nutritional deficiencies with which they are generally associated, go on robbing the farmers' income year after year without a systematically supervised service to stop their depredations.

The Pan-American Entente

North American countries sold Latin American countries 46.4 per cent more goods in the first seven months of 1940 than during the corresponding seven months of 1939. The total value of this merchandise was $412,089,000. At the same time (January-August) we took 30.7 per cent more goods than during that period of 1939. The value of the imports was $378,778,000. Among our exports were 110 registered dairy cattle purchased by Chile for a total of $150,000.

The balance of trade in favor of the United States amounting to $33,311,000 for the seven months indicated speaks well for the readjustment of world affairs on the Western Hemisphere as they affect this country. Since it is believed that the shortest cut to farm relief is building up our industries, the favorable balance should be gratifying.

Corn sealing with corn loans at reasonable prices is the best approach ever made to the problem of price stabilization.—*From the Prairie Farmer.*

Caseous Lymphadenitis of Deer (Odocoileus Hemionus) in Washington

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FOR SEVERAL YEARS reports of diseased deer in the Northwest have been brought to our attention by hunters, game protectors and other game officials. The reported etiology of the disease has been as varied as the sources of the information and at different times has been ascribed to necrotic stomatitis (*Actinomyces necrophorus*), actinomycosis (*A. bovis*) and pseudotuberculosis.

The descriptions of the lesions of the disease as noted by hunters and game officials were also quite varied. Some observers reported seeing no evidence of disease in an animal that they had shot and dressed, but the following morning they would find the inside of the carcass covered with a green slime. Others would find so-called boils in the thoracic or abdominal cavities, varying in locations, but most frequently found along the vertebral column. Animals also were observed to be affected with sores over the body, but in excellent flesh.

As a result of requests made to state game protectors and other game officials to supply the laboratory with specimens showing typical lesions of the disease, two entire carcasses and two parts of carcasses were received.

LABORATORY STUDIES

Case 1 was the dressed carcass of a four-point male deer (*Odocoileus hemionus*) in excellent flesh. The lesions observed at necropsy were those described by hunters as "boils" or "sores" and consisted of three abscesses, 4 to 6 cm. in diameter, located in the thoracic cavity attached to the pleura and muscles along the vertebral column. Two of the abscesses had established fistulous tracts through the wall of the thorax perforating the skin. The hair around the external orifices of these fistulas was matted with dried exudate, indicating a constant discharge. Active lesions were confined to the fore quarters, but in removing the hide, strands of scar tissue were noted, indicating previous fistulas that had healed. Some of these old fistulas could be traced into the deep muscles of the back and loin, but no lesions of the healed abscess could be found in the abdominal cavity. In dissecting the muscles of the fore leg, four small abscesses were found that had no external openings.

Case 2 was the sternal part of a deer thorax. Three large abscesses, 5 to 8 cm. in diameter, were found adherent to the dorsal surface. All abscesses possessed the usual heavy fibrous wall and contained the typical thick blue-green exudate.

Case 3 consisted of four unusually large abscesses removed from a male deer. The exact location of the abscesses could not be determined owing to the fact that only small parts of muscle remained attached to them. The largest abscess measured 17 cm. in greatest length and 7 cm. in width. The walls of this abscess were also unusually heavy.

Case 4 was the dressed carcass of a young female deer (*O. hemionus*) in good physical condition. Necropsy revealed several small abscesses, 1 to 2 cm. in diameter, on the dorsal surface of the sternum. A larger abscess, 4 cm. in diameter, was attached to the lateral border of the diaphragm and perforated the abdominal wall and skin. There were three abscesses, 3 to 4 cm. in diameter, in the right parietal surface of the liver with adhesions between this and the adjacent peritoneum.

All the abscesses examined were characterized by thick walls of connective tissue and contained a viscid, homogenous greenish-blue exudate. Cartilaginous or bony

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structures were not involved in the cases studied.

Smears of the pus stained by Gram's method revealed the presence of pleomorphic, Gram-positive, rod-like bacilli, occurring singly or irregularly in small clumps. Routine examinations of the pus for *A. bovis* and *Mycobacterium tuberculosis* were negative. Coccoid forms were generally predominant on culture media. The organism was nonmotile and capsule formation was not observed in direct smears or culture media.

Pure cultures were obtained by streaking the pus on blood-agar plates. Direct isolations showed no evidence of contaminants, and well-isolated colonies were obtained on primary isolations. Single colonies were "picked" and transferred to brain-heart infusion broth, pH 7.4. The growth from broth cultures was stained and examined for purity, then streaked again on blood-agar plates to insure pure cultures.

Cultural characteristics reveal the organism to be an aerobe and a facultative anaerobe. Moderate growth occurred in 48 to 72 hours on routine media incubated at 37° C. after primary isolation. Growth on blood agar was rather luxuriant, and hemolysis was evident at 48 hours. The colonies on blood agar were circular, convex and dull, with a definite raised center. They were opaque, grayish and friable. In brain-heart infusion broth, growth was moderate without clouding of the medium. The growth was granular with pellicle formation, and sediment was deposited on the sides and bottom of the tube. Growth in gelatin stabs was filiform in nature with no liquefaction in 14 days.

Litmus milk was unchanged after five days of incubation. Dextrose and levulose were fermented after 48 hours at 37° C. with the production of acid, but no gas. Mannite, salicin, lactose and saccharose were not fermented. Cultural and biochemical characteristics of the organism identified it as *Corynebacterium ovis*.

Pathogenicity. — Male guinea pigs injected intraperitoneally with 0.5 cc. of a 24-hour broth culture died in five days. The symptoms noted were suggestive of a mild intoxication. Necropsy revealed a pronounced peritonitis accompanied by numerous minute abscesses on the omentum, liver and spleen.

Two male guinea pigs were then injected intraperitoneally with a smaller dose, 0.2 cc. of pus suspension obtained from a deer abscess and a 24-hour culture, respectively. The guinea pigs died 35 to 40 days following inoculation, showing extreme emaciation and marked orchitis. On necropsy a small abscess was found at the site of inoculation and numerous abscesses, 0.3 to 1 cm. in diameter, on the liver, spleen, and in the omentum. There were extensive adhesions involving the liver and other viscera while the testes had undergone necrosis with partial dissolution, leaving a large quantity of purulent exudate in the tunica vaginalis. Pure cultures of *C. ovis* were recovered from the abscesses in both guinea pigs.

Symptoms of intoxication, when larger doses of culture were administered, suggested the presence of a toxic substance in cultures of this organism. In an effort to demonstate a soluble toxin, cultures were made in brain-heart infusion broth, pH 7.4, to which 1 per cent solution of proteose-peptone had been added. These were incubated at 37° C. for ten days and filtered through Berkefeld N candles. Guinea pigs were then injected intraperitoneally with 2 cc. of the resulting filtrates, but the animals showed no deleterious effects. Considerable variation in the ability of different strains of *C. ovis* to produce toxin had previously been observed.

DISCUSSION

Caseous lymphadenitis is apparently a common disease of deer in the Pacific Northwest. Hammersland and Joneschild[1] have reported what is believed to be the same disease in deer in Montana, as pseudotuberculosis of deer, while Shaw and coworkers[2] have reported that a disease simi-

[1]Hammersland, Hazel, and Joneschild, E. M.: Pseudotuberculosis of deer. J.A.V.M.A., xci (Aug. 1937), n. s. 44 (2), pp. 186-192.

[2]Shaw, J. N., Simms, B. T., and Muth, O. H.: Some diseases of Oregon fish and game and identification of parts of game animals. Oregon Exp. Sta. Bul. 325 (1934), p. 22.

lar to caseous lymphadenitis occurs in the deer of eastern Oregon.

Records of the disease are as yet too few to warrant conclusions as to any definite limits of its occurrence, although all our specimens were obtained from the north-central part of Washington. There is a heavy population of deer in this area. During winters of moderate or heavy snowfall, some of the deer herds in north-central Washington are on winter range that is seriously overpopulated and depleted of forage. It is possible that these problem deer-areas may serve as foci for the dissemination of lymphadenitis and other diseases.

The portal of infection with caseous lymphadenitis has not been proved in deer; it is probable, however, that the disease may gain entrance to the body by various routes. Abrasions or other injuries to the skin as well as the respiratory and digestive tracts must be considered as routes of infection. Feeding on coarse roughage over a period of time may be responsible for the infection gaining entrance through the digestive tract.

Present limited data make it impossible to estimate the number of animals affected or the loss occasioned by this disease, although it is known that a number of affected carcasses brought in by hunters are discarded each year. It has been the practice of the Washington State Game Commission to permit the taking of a second deer to replace one found to be affected with caseous lymphadenitis. It is believed that the infection is not injurious to man, although, from the esthetic standpoint alone, it is not advisable to use infected carcasses.

The cases observed to date have been benign in character, and fatal termination would occur only if the disease became generalized. The affected animals probably would become badly emaciated, and the disease, as in sheep, would probably terminate in a fatal pneumonia. Rupture of one of the abscesses in the abdominal cavity would probably result in a fatal diffuse peritonitis. The carcasses reported by the hunters as turning green over night undoubtedly contained a small unnoticed abscess, which being cut when the animal was eviscerated permitted growth and spread of the organism before the carcass cooled.

Caseous lymphadenitis is prevalent in the domestic range sheep of Oregon and Washington, and the organism has been isolated from sheep feces and from bedding grounds. The disease in sheep is reported as being more common in rams and ewes than in lambs. Since domestic range sheep have been grazed extensively over most of the deer range in Washington, it is probable that the infection in deer is a direct result of this multiple use of the deer range. Further observations are essential to obtain more complete knowledge of the epizoölogy and the possibilities of control of this disease in deer.

SUMMARY

Corynebacterium ovis was isolated from characteristic abscesses in four deer *(Odocoileus hemionus)*. The etiology of the organism is identical with that of the organism that causes caseous lymphadenitis in sheep. A cultural study of this organism, with symptoms and lesions produced in experimental animals, is important to differentiate the disease from other suppurative processes.

Progress Reports Not Fiction

Quoting from the secretary's official report for 1892: "The total membership is 262. There was due including the year's dues $997.00. . . . Less than 20 per cent of the membership owes two or more years' dues and of this number a great proportion only await an opportunity like today to make good their dereliction. . . . In three short years over 200 have knocked at your doors for admission—more new members than the total membership in 1888. From an application list of 14 at the New York meeting in 1888, we have today, for 1892, the enormous number of 106—more than one third of the entire membership. From an attendance of 40 in 1888, we have had at Chicago (1890) and Washington (1891) over 100."

Endocarditis in Swine Due to Erysipelothrix Rhusiopathiae and to Streptococci*

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INFLAMMATORY LESIONS of the heart characterized by vegetative proliferations on one or more of the valves and/or the mural endocardium of the auricles and ventricles have been known to occur in swine for many years. Most of the descriptions of the pathological findings in swine erysipelas mention the occurrence of a vegetative or verrucose endocarditis as a lesion of a chronic form of this disease. In fact, the presence of a valvular or mural thrombus is accepted as conclusive evidence of swine erysipelas in many instances. This is incorrect, and it is the purpose of this paper to show that certain streptococci produce proliferative endocardial lesions indistinguishable from those caused by the swine-erysipelas organism, *Erysipelothrix rhusiopathiae*.

During the past ten years 19 cases of endocarditis, all manifesting distinctive proliferative vegetations, have been examined and studied in this laboratory. The study included a gross and microscopic examination of the lesions in the heart and the bacteria responsible for them. These 19 cases represent about 1 per cent of the porcine hearts examined for the same period.

From the standpoint of the bacteria isolated, *E. rhusiopathiae* was obtained from eleven and streptococci from eight. Beyond determining the hemolytic characteristic of the streptococci isolated, no further attempt was made to classify them. Five of the cultures produced the Beta-type hemolysis when grown on blood (horse) agar plates, and two were nonhemolytic. One culture was not studied for this characteristic.

The gross appearance of the vegetations was strikingly similar in all 19 cases. They were characterized by fungus-like growths attached to one or more of the valves of the heart and in some cases to the mural endocardium. The free or outer surface of the vegetations was irregular and resembled a piece of cauliflower. This surface was crumbly and broke off readily when handled, whereas the basal portion was more firmly attached to the valve leaflets or mural endocardium, as the case may be. The color of the lesion varied. In some cases it was red due to hemorrhage, and in others it was yellowish white. The proliferative mass was always quite large so that the orifice guarded by the affected valve was practically occluded. Those attached to the mural endocardium were smaller. A pedunculated thrombus attached to the convex surface of two of the cusps of the aortic valve was found in one case. The thrombus measured approximately 2 cm. in length and extended into the lumen of the aorta. The intimal surface of the aorta was not affected.

The location of the lesions within the hearts was not confined to any particular valve in either of the two groups. In ten of the swine-erysipelas cases the distribution within the heart was as follows: The mitral (bicuspid) valve only was involved in three cases; the tricuspid only in two; mitral and tricuspid in three; mitral, tricuspid and aortic in one; and the mitral, tricuspid and mural endocardium in one. In the cases due to streptococci the mitral valve only was involved in one, the tricuspid only in three, mitral and mural endocardium in one, tricuspid and mural endocardium in one, tricuspid and pulmonary in one, and the aortic only in one.

The microscopic picture of the thrombus shows that the proliferative reaction is composed of fibrous tissue, leucocytes, polyblasts and small areas of hemorrhage. Collections of platelets and fibrin arranged in layers and swirls cover the outer edge of the proliferative zone. The proliferative reaction is most marked in the leaflet, but

*Paper No. 1863, scientific journal series, Minnesota Agricultural Experiment Station; contribution from the Division of Veterinary Medicine.

the adjacent myocardium also is involved. The leaflet is thickened by fibrous tissue which extends deep into the thrombus. In many of the cases this portion of the reaction was richly supplied with blood vessels. Masses of bacteria appearing as clumps or clusters were usually found in the outer parts of the proliferative zone and in the platelet area. The composition and structure of the lesion was very similar in all of the cases examined.

While the cases of vegetative endocarditis reported here represent only a small series, nevertheless they show that streptococci as well as *E. rhusiopathiae* are causal factors. Because of this fact the question of differentiating between them is important. *E. rhusiopathiae* is the causative agent of a contagious disease which may become widespread and serious, whereas the endocardites of streptococcic origin are sporadic or noncontagious. To be able to differentiate between them on the basis of the gross appearance of the inflammatory proliferation seems quite improbable. Bacteriological procedures which result in the isolation of the particular organisms are the only dependable way of making a definite and correct diagnosis.

When circumstances are such that a bacteriological examination can not be obtained, certain other procedures will have to be considered in reaching a diagnosis. An anemnesis and *status praesens* of the drove as a whole often will produce information helpful from the standpoint of diagnosis. For example, in case of vegetative endocarditis of streptococcic origin it is unlikely that more than one animal will be affected. Where the swine-erysipelas organism is involved, the history may disclose that one or more pigs were sick and died within the past several weeks or are sick at the time the endocarditis case is discovered. The nature of the illness in those pigs may not be similar to that of the case at hand, since swine erysipelas is a disease that manifests itself in different forms—acute, subacute and chronic. In the event the history fails to reveal recent cases of illness or death, it may be advisable to wait a week or two for the purpose of ascertaining whether new cases will develop. Should pigs become sick within a few weeks of the occurrence of the case in question and should they display clinical and postmortem signs of erysipelas, it would be justifiable to assume *E. rhusiopathiae* was responsible for the endocardial disease. The possibility of a sporadic case of swine erysipelas with endocardial lesions must be kept in mind, however.

That it is important to determine the specific cause of the vegetations occasionally found in the hearts of swine is obvious. The treatment and management of the animals in the drove depend upon a definite diagnosis. The approved methods of handling swine erysipelas should be instituted when this disease is present. No specific therapy is indicated where the disease is due to a streptococcus.

Hybrid vs. Open Pollinated Corn

The controversy over the nutritive value of hybrid corn as compared with open pollinated varieties recalls the arguments of former days over the relative value of yellow and white corn. Long before science stepped in to give the reason, farmers were aware that white corn was far inferior to the yellow kind in feeding live stock, although some experts on feed and feeding did not agree with the farmers.

At the present time hybrid corn is in the court of general opinion. Some contend that it has a low nutritive value and others dissent. A test made with pigs at the Ohio station shows that the nutritive value of hybrid corn varies. Some was found to be poorer and some better than open pollinated varieties. Where the value of open pollinated corn was 100 per cent, hybrid varieties ranged from 90.4 per cent to 107 per cent. In seven feeding tests the average for hybrid corn was 97 per cent.

The King Ranch in Texas with its million acres is two thirds the size of Delaware. The Victoria River Downs Ranch in Australia contains 16,000 square miles, which is equivalent to one third of New York.

The Principle of Tissue Autolysis and Its Possible Application in Canine Therapy*

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PREVIOUS EXPERIMENTS[1, 2] have indicated that the fundamental process underlying the progress of lymphatic leucemia in animals is self-perpetuating tissue autolysis which on one hand is represented by stimulation of blood cells and on the other hand by their degeneration or destruction. This self-perpetuating, vicious cycle of stimulation and destruction of tissues is considered to be concerned in malignancy.

Self-perpetuating tissue autolysis involving the blood cells has been induced experimentally in chickens by a large number of widely diversified initial stimuli: the intravenous injection of bacteria of the paratyphoid and typhoid groups, a certain level of vitamin A deficiency, inadequate ventilation of hen-battery plants and the intravenous injection of freshly emulsified, desiccated or autolyzed homologous tissues. Submission of chickens to any of these stimuli results in tissue autolysis in a reasonably short period of time. However, the development of self-perpetuating tissue autolysis is dependent upon repeated stimuli which must lead to a chronic, but progressive process. Experimentally such a process can be induced readily in the case of injections by increasing the dosage and frequency of injections. In case a progressive process is not initiated, self-perpetuating tissue autolysis does not develop and considerable subsequent immunity to tissue autolysis results. When such immunity develops it is extremely difficult to induce self-perpetuating tissue autolysis in the same bird for considerable time thereafter. It has occurred to the author that this may have a possible application in canine therapy.

In 1897, Turck[3] reported on the extraction of a substance he called cytost from tissue cells. According to his theory, cytost is liberated from cells injured in any manner whatsoever. Cytost liberated in small quantities was stimulating to the tissues with which it came in contact; the liberation of large amounts induced death, while the liberation of intermediate amounts induced disease. According to his theory, disease was explained on the basis of cytost, whether the cause for liberation was physical, chemical or biological. Cytost was specific for the species from whose tissues it was derived. He also reported that the liberation of cytost from injured tissues in an operative area was the primary cause of surgical shock. Turck's contention concerning the toxic nature of shock and its sequelae was recognized later by Jeanneney,[4] Hartmann[5] and Limousin.[6] The latter author observed that tissue autolysis liberated the toxic substance cytost.

McKim[7-10] reported on prenatal poisoning by tissue toxin (cytost) and its effect

*From the Florida Agricultural Experiment Station; presented at the eleventh annual meeting of the Florida State Veterinary Medical Association, West Palm Beach, Fla., October 28-29, 1940.

[1]Emmel, M. W.: The etiology of fowl paralysis, leukemia and allied conditions in animals. Parts I-X. Fla. Agr. Exp. Sta. Bul. 284, 293, 305, 306 and 313 (1935-37).

[2]*Ibid.:* The nature of leukemia: a new fundamental principle leading to the development of specific disease. J.A.V.M.A., xciii (Nov. 1938), pp. 316-319.

[3]Turck, F. B.: Surgical shock. J.A.M.A., xxviii (1897), p. 1160.

[4]Jeanneney, G.: Theories pathogeniques du choc traumatique. Le Progres Medical, xxxvi (1921), p 425.

[5]Hartmann, M.: A propos du shock traumatique. Bul. et Mem. Soc. de Chir. d. Paris, xlviii (1922), p. 660.

[6]Limousin, L.: Les cytosts. J. Med. Francais, xii (1923), p. 238.

[7]McKim, O. E.: Tissue toxins, filterable viruses and their differentiation. Vet. Med., xxx (1935), p. 26.

[8]*Ibid.:* Predisposing causes of canine distemper. Vet. Med., xxix (1934), p. 247.

[9]*Ibid.:* Tissue extract (cytost) and its importance as an etiological factor in disease. Vet. Med., xviii (1923), p. 825.

[10]*Ibid.:* Prenatal poisoning by tissue extract (cytost) and its effects. Vet. Med., xix (1924), p. 201.

on the embryo or fetus and indicated that tissue autolysis induced by deficiency diets was important in this respect. McKim again reported on the prenatal effect upon the offspring by tissue toxins of the prospective mother during pregnancy regardless of the influence which produced these toxins. In a subsequent article McKim described tissue toxins as products of diseased and destroyed cells and discussed their relation to pneumonia, enteritis, kidney and nerve involvements and the relation of low concentrations to the development of immunity against such toxins.

In the work of the present author on leucemia it has been shown that the repeated intravenous injection of freshly emulsified, desiccated and autolyzed homologous tissues induces tissue autolysis and that an intoxication factor is concerned. The importance of initiating a progressive process by an increase in frequency and amount of dosage has been mentioned as well as the development of immunity against the injected tissue when a progressive process is not maintained. For instance, in the early stages of experimental work of this nature, two mongrel dogs (litter mates) were being injected with desiccated canine liver. One animal was injected three times a week with increasing doses while the other was injected once a week with increasing doses. Tissue autolysis was maintained in the animal injected three times a week and the animal showed considerable clinical evidence of intoxication. On the other hand, the animal injected but once a week, under similar environmental conditions, remained in excellent physical condition, the hair became sleek, and the animal became spirited and an excellent specimen of physical fitness.

The experiment was repeated on two additional mongrel dogs (litter mates). The results were similar. Two weeks after final injection of the first two animals each was injected intravenously with equivalent amounts of a suspension of *Salmonella enteritidis*. The animal which was originally injected three times a week died in three days while the animal injected but once a week did not show any outward symptoms resulting from such treatment. The second group of animals was injected with maximum dosages of desiccated canine liver three times a week. The animal receiving the original injections three times a week died during the third week, while the animal which had received the original injections but once a week did not show any outward evidence of disease.

Similar experiments were conducted in chickens in which tissue autolysis was initiated by the intravenous injection of desiccated chicken liver and microörganisms of the paratyphoid group. After the birds were allowed to recover from the results of tissue autolysis so induced, they were again injected intravenously with the same products. As compared with chickens not thus treated, it was amazing to observe the amount of these materials that could be injected without inducing disease. One group of three chickens in which immunity developed were injected with a heavy suspension of *S. enteritidis* three times a week until the birds had lost an average of 1¾ lb. in weight. None of the birds in this group died. A check group of three birds of the same age and breed died of bacteremia after the second injection of the microörganism. These experiments indicate that a high order of immunity can result from the proper injection of desiccated normal homologous tissues into dogs and chickens. There is no reason to suspect that other species of animals would react differently.

As claimed by Turck, there is a definite amount of desiccated homologous tissue that can be injected into an animal without causing death. This amount varies with the individual, species and age. Although the present author can not accept all of Turck's theories regarding cytost and its nature, there should be but little question that the products of degenerated or destroyed cells, or "tissue toxins," as McKim prefers to call them, are of extreme importance in disease regardless of their original cause. In fact, but few diseases can be named in which destruction of tissue does not occur. This is true not only of bacterial and virus diseases, but also of

various deficiency and parasitic diseases. On the interior of the body these toxic products must be absorbed and an attempt made at elimination. On the surface of the body they may be cast off with little harm to the organism, which recalls that one of the cardinal principles of surgery is good drainage. Why? An absorption of excessive amounts of degenerated or destroyed cell products does not promote healing and is injurious to the organism. The restoration of an operative area to normal function following a surgical operation depends almost entirely upon the reëstablishment of circulation in the operative area. In case circulation is not reëstablished in reasonable time following an internal surgical operation, tissue cells in the area degenerate with the result that toxic products must be absorbed. The experimental intravenous injection of tissues indicates that the amount of tissue that can be injected without inducing injury or immediate death is comparatively small, providing the animal must depend entirely upon natural immunity to these products.

In recent years the practicing veterinarian has become cognizant of the value of blood transfusions. Most small animal practitioners maintain dogs available at all times for blood transfusions. It has occurred to the author that the value of transfusions in those cases which react favorably to such a procedure would be greatly enhanced if the donor had been immunized previously to canine tissues.

Normal lung, spleen, kidney and liver tissue from the chicken has been used with equally good results in chickens. It seems quite possible that the immune serum might have considerable specificity for the tissue injected. Experiments should be conducted on dogs to determine this point. Normal liver tissue was used in the experiments described in this paper.

The liver was cut in thin slices, spread on a pane of glass and dried in an oven at not more than 80° C. The desiccated tissue was pulverized so as to pass through a 200-mesh sieve. The pulverized desiccated tissue can be kept in this state in a desiccator or sealed tube for long periods without apparent deterioration.

The amount of desiccated liver tissue that can be injected initially in the process of immunization depends largely upon the age and breed of the dog. However, it is fortunate that as the maximum dosage is approached there is a definite effect on respiration. Respiration is usually accelerated, may become irregular, increase in depth and in some cases is retarded. When any of these irregularities occur they are definite indications that comparatively small additional amounts will induce immediate death. However, there is a considerable margin of safety if the injections are made carefully. A 2-month-old dog weighing 20 to 25 lb. should be able to stand an initial injection of 50 mg. of desiccated liver tissue. It should be indicated that there is considerable individual variation in the amount of desiccated tissue that can be injected safely. Respiration should be observed during injection.

The desiccated tissue is triturated in a mortar with a few drops of physiological salt solution until it has the consistency of a smooth paste. Additional salt solution as required can be added for injection. The injections are made intravenously, slowly. Subsequent injections should be made once a week, with the dosage being increased 20 to 30 mg. at each injection.

Experiments have shown that there is a limit to which the dosage finally may be increased. In a 25- to 30-lb. dog this limit is approximately 200 mg. When this point is reached the animal should be considered immunized and of service as a donor in ten days.

Although experiments have not been conducted to ascertain the duration of immunity, it is known that considerable immunity is still present in six months. It would not be necessary to immunize blood donors in this manner but twice a year, which should not be an impractical procedure.

Several years ago at the Miami meeting of the Florida state association Dr. Bild of Miami made the statement that the dog upon which he was demonstrating an operation was immune to operative procedure.

Theoretically at least, the dog was kept in this state by frequent operation. He was maintained for the purpose of blood transfusions, particularly to surgical cases. In the opinion of the author Bild was utilizing the theory advanced in this paper. There is every reason to suspect that a much higher order of immunity could be developed and maintained in a donor by the intravenous injection of normal canine tissue than by resorting to operative procedure. The principle concerned should be intriguing to small animal practitioners.

SUMMARY

The toxic products of degenerated or destroyed tissue cells is an important factor in disease and surgical procedures. Considerable immunity against these toxic products arises through the immunization of dogs and chickens to normal homologous (species) liver tissue. It is suggested that the efficacy of blood transfusions in dogs possibly can be increased by first immunizing the donor against canine tissues. The preparation of tissue and method of procedure for the immunization of donors is described.

Artificial Insemination in Soviet Russia

In the May issue of the *Journal of Breeding* the director of the Laboratory of Artificial Insemination in Moscow describes the results obtained in the practical application of artificial insemination. In the Lenin Academy for Agriculture in Moscow, a special laboratory has been established in which the experiments in artificial insemination of domestic animals are studied according to a definite plan, and applied in practice. The investigations revealed that the "sponge" procedure recommended for horses is not suitable as, of the impregnated mares, not more than 30 per cent became pregnant. It was shown that the sperma is injured by the sponge and dies or remains attached to the spores of the sponge. Besides, in cattle the sponge absorbs the vaginal secretions, which might result in the transmission of diseases. For this reason, for every species of animals specially designed instruments are being used.

After the conclusion of the laboratory studies, which also included experiments designed to determine the viability of the sperma and the course of the estrual cycle in the female, the procedure was applied in practice. Three hundred specially trained men were employed to conduct this work. In 1936 over 9 million animals were impregnated and in the subsequent three years, 11.7, 15 and 17.5 million, respectively. The results are considered as extraordinarily satisfactory—so much so that at the present in large sections of the Soviet Union artificial impregnation is exclusively employed.

The report also includes numerical achievements in individuals. Thus the use of the sperma of one bull successfully impregnated 98 per cent of all cows, and in two years 2,620 calves were obtained. With the sperma of a Rambouillet ram a total of 1,500 ewes were impregnated, yielding 1,800 lambs. In another case the semen from one ram impregnated instead of the usual 40 ewes, 12,646 females. The successful impregnations apparently vary with the cleverness of the technician. In one instance in 56,000 ewes the results were 98.5 per cent. Thus, it was possible without importation to improve very rapidly the breeds of entire sections, and to completely change the picture of the breeds. The writers point out that in the past ten years 65 million animals were artificially impregnated in the Soviet Union and offer this as a proof of the practicability of the procedure.

Phenothiazine

Phenothiazine is gaining in popularity as an anthelmintic of great merit in expelling worm parasites from the digestive tract that were heretofore rebellious to medical treatment. It "takes" 90 per cent of nodular worms and 100 per cent of stomach worms in sheep, and removes most of the palisade worms from the large bowels of horses in a single treatment.

Some Diseases of the Ear of Dogs*

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THIS DISCUSSION will be confined principally to diseases or conditions external to the ear drum.

Otorrhea is one of the terms used to designate an inflammation of the ear. Clinically we recognize three or four types of otorrhea of the external ear. They are the catarrhal, the parasitic, the chronic indurative and that type, otorrhea cerumenosa, which is due to excess formation of wax. Any one of these types may blend into another. A case of parasitic otorrhea may progress to catarrhal otorrhea with ulcers of the cartilage and even inflammation of the middle and inner ear. In addition to these conditions we are confronted with wounds, tumors of the lining of the external ear, hematomes of the external ear flap and various skin diseases, such as ringworm and the manges.

PARASITIC OTORRHEA

Parasitic otorrhea is an inflammation of the lining of the external ear due to the presence and activity of a mange mite. The disease has been called chorioptic otacariasis, auricular scabies, parasitic otitis, epileptiform disease of sporting dogs, and canker. The parasite causing the trouble has had a number of names, among them *Sarcoptes ecaudatus, Symbiotes auricularis, Choriptes auricularis, Dermatophagus auricularis* and *Otodectes cynotis*. The parasite is now called *Otodectes cynotis*. It does not burrow in the skin as does the sarcoptic mite, but supposedly pierces the skin to suck lymph and so produces an inflammation (Monnig). The irritation produced is probably mechanical from the moving about of the parasites, although a certain amount of infection of the ear lining usually accompanies this condition.

Symptoms.—Intense itching is the most prominent symptom. It results in scratching of the ear with the feet, rubbing the ear on the floor or ground and frequently quite vigorous shaking of the head. The shaking of the head often becomes violent and is especially noticeable when the dog starts to move about after being at rest for some time. Manipulation of the ear also induces shaking.

The itching induced by this parasite may bring on epileptiform convulsions, especially in the young. This fact has been impressed upon us so frequently that we always examine the ear of dogs and cats that are presented to us because of convulsions. The vigorous shaking many times results in hematome of the ear flap or in sores on the end of the ear. These sores on the end of the ear are practically impossible to heal if parasitic otorrhea exists and it can not be controlled. The most important part of the treatment of these sores is the removal of the cause of the shaking.

Diagnosis.—We make the diagnosis of parasitic otorrhea if we find the parasite. Failing to find the parasite, we also make this diagnosis if we find a chocolate-brown, waxy discharge. Other conditions may cause severe itching, but the chocolate-brown, waxy discharge is typical of parasitic otorrhea. The Otodectes parasites are rather large for mange mites, being visible to the naked eye in many cases. A small hand lens may be helpful in finding the mites in the discharges removed from the ears. A simple procedure is to place the discharges on a piece of paper in sunlight or in a warm place. The heat soon causes enough activity on the part of the parasites that movement can be noticed with the naked eye. Within a short time, if parasites are present, they may be seen crawling around on the paper.

Under the microscope, this parasite can

*From the New York State Veterinary College at Cornell University; presented before the Section on Small Animals at the 77th annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

be differentiated from the sarcoptic mite by its legs, which are much longer and extend beyond the abdomen. Mixing some of the chocolate-brown, waxy discharge with a little mineral oil on a glass slide may help one to discover the parasite under the microscope, using low-power magnification.

Treatment.—Treatment consists of the destruction and removal of the parasites and the alleviation of the irritation produced by their presence. Cleaning of the ear removes the greater portion of the parasites and paves the way for the destruction of the young mites as they hatch out. The therapeutic problem presented by this condition calls for the use of an antiseptic, an anesthetic and parasiticide. We not only have the problem of ridding the ear of the parasites present, but also the one of preventing a new crop from developing. We know that the many folds inside the ear hamper positive and complete cleaning. Our practice is to clean the ear and apply our treatment daily for four or five days. Then the ear is treated every three or four days for three weeks. The applications toward the end of treatment will be more of a protective nature than parasitic, such as zinc oxide ointment or petrolatum.

Our treatment the first few days destroys and removes the parasites. Our later bland treatment protects and soothes the skin lining of the ear and also from time to time removes eggs and newly hatched parasites. In many cases prompt relief follows the first three or four days' treatment, but there is a recurrence in a month or six weeks if treatment is not continued. We do not know the length of time required for the hatching of the eggs. Monnig believes the life cycle may be similar to that of the Psoroptes, which would be about nine days from egg to adult. However, if treatment is continued occasionally for three weeks after the relief of symptoms, there is not likely to be a recurrence. Of course, complete cure can be followed by reinfestation.

Many different preparations have been employed in the treatment of parasitic otorrhea. Herms lists sulfur ointment, 10 per cent tincture of iodine in glycerin, and 1 per cent phenol in linseed oil. Hall uses eight parts of carbon tetrachloride in three parts of castor oil. Berge has used 3 per cent phenol in olive oil, and the following mixture: one part each of betanaphthol and ether in 20 parts of petrolatum; to this add 1 per cent phenol, 0.5 per cent cresol and 5 per cent salicylic acid. Brumley uses liquid petrolatum alone or with 5 per cent phenol added. Hutyra and Marek list 10 per cent oil of caraway in olive oil; equal parts of balsam peru and glycerin; also naphthol ten parts, ether 30 parts and olive oil 100 parts. We use one part of mercuric nitrate (citrine) ointment melted at a low heat and added to three parts of warm neatsfoot oil. We also use a 1:1,000 solution of mercuric bichloride in 70 per cent alcohol. Another mixture we use contains 20 parts of phenol, 40 parts of camphor and 40 parts of liquid petrolatum, especially in those cases where itching is intense.

The above list of preparations used in this condition is by no means complete. Each clinician seems to have his own particular parasiticide mixture that he has developed for the treatment of this disease. We have used a number of the above or similar ones and believe them all to be of value. However, we think that thorough cleaning of the ear of all wax and discharges is probably the most important part of any treatment for this condition.

TUMIFIED EAR OR HEMATOME OF THE EAR FLAP

One of the sequels of otodectic mange is hematome of the ear flap or tumified ear. Rarely is a hematome of the ear flap caused by anything other than the dog shaking its head and breaking a blood vessel in the ear flap. If seen early, the enlargement is usually found near the tip of the ear. After a few hours or days the whole external ear may be involved. It has been our contention for years that the hematome occurred between two layers of cartilage. A recent histological study of the cartilage of the concha seems to indicate that there is only one layer of cartilage. If such proves to be the case, then we will have to consider that

the hemorrhage occurs between the lining skin of the ear and the cartilage.

Treatment.—Our treatment has been to incise the hematome on the inner surface of the ear, to clean out all shreds of fibrin and to quilt the medial and lateral surfaces of the hematome together. We do this under as nearly aseptic conditions as possible. To protect the ear afterward, we pad both ear flaps with cotton, lay them back over the head and apply a night cap, or many-tailed bandage, to hold them in place. By so doing, we hope to prevent further shaking of the head and also the entrance of infection. If infection can be prevented there is a fair chance that the ear flap will heal without crinkling.

We have tried daily aspiration of the fluid in a few cases. This has not always been successful because of seepage of serum into the hematome cavity. In one case we were successful in using aspiration because we were able to insert a cotton plug into the ear canal and bind the flap around this plug so that some pressure was applied to the ear. This seemed to hold the inner surfaces of the hematome in contact so that they healed together. In one case, after draining a small hematome of the ear, we held the surfaces together by applying a paper clip. The next time we tried it, the pressure apparently was too great because there was scar formation at the point of contact of the clip and also permanent loss of hair. In another case, a German Shepherd, the dog was able to shake his ear out from under the night cap. To protect the ear during the healing process, after quilting we bound the ear around a plug of gauze and then slipped a length of small-size stockingette over the ear and tied the base of this tube around the head. In this case the ear stuck out straight from the head with the result that there was less effort on the part of the dog to rid himself of the bandage.

In the case of hematome of the ear in cats, Dr. Milks and the writer have been quilting the ear through holes in two metal plates. By so doing, we have obtained fairly even pressure. We also have been able to shape the plates so that the ear flap healed more nearly in its original shape. The plates were made by cutting thin sheets of aluminum, obtained from an aluminum sauce pan, to the size and shape required. Numerous holes were bored through both sheets to reduce weight and to allow for suturing through and through.

Before leaving the subject of hematome of the ear flap, we would like to say that we do not recall a case in which there was not some irritation in the ear canal. In most cases it could be demonstrated that parasitic otorrhea existed. If treatment of the hematome is not accompanied by treatment of any irritation of the lining of the ear, recurrence is quite liable to follow.

CATARRHAL OTORRHEA

Catarrhal otorrhea is similar to the moist eczemas of the skin that are found on other parts of the body. In this condition there is a continual discharge of purulent material from the ear. The infection present may be the result of a parasitic otorrhea, the accumulation of dirt, the presence of foreign bodies, the breaking down of tumors, distemper and excess moisture.

Symptoms.—If only one ear is affected, the dog usually holds the head sideways with the diseased ear down. There is some itching. The condition is painful and, because of this, scratching, shaking and rubbing of the ear are done carefully. Manipulation of the ear results in pain and also gives a "squashy" sound. In a beginning case the exudate from the ear is thin; later it becomes thick, yellowish, purulent and sometimes streaked with blood. The parts of the ear which come in contact with the discharges are inflamed and quite tender. After this condition has existed for some time, there may be ulceration of the lining of the ear and exposure of cartilage.

Treatment.—Before the application of any particular drug is tried, the discharges must be removed as completely as possible. This can be done either with dry pledgets of cotton or by washing with various solutions. The solutions most commonly used are soap and water, ether, boric acid solution and chlorine solution. The ear should be dried after cleaning. The use of an oto-

scope at this point will be a great aid in determining the extent of damage done to the lining of the external ear.

Medication may be antiseptic, astringent, or absorptive and drying, or a combination of all three. Occasionally it is necessary to apply a local anesthetic. We have used butesin-picrate ointment, butyn solutions, 5 per cent phenol in glycerin and camphophenique for this purpose. Of the antiseptic solutions the following are frequently used and found valuable in controlling the infection: 1 per cent chloramine; alcoholic and aqueous solution of tannic acid, freshly prepared, and also 5 per cent each of tannic and salicylic acids in alcohol. In beginning cases we believe we have more rapid results when we apply a 5 per cent aqueous solution of silver nitrate to the lining of the ear. Practically all dusting powders are of value in this condition as they tend to dry up the excess secretions. The application of a mild ointment, such as zinc oxide ointment, is of considerable value in protecting those parts not already infected.

No two cases of catarrhal otorrhea can be treated exactly alike. The form of treatment that seems best in one case may prove a failure in the next. The general principle of using astringent or drying drugs should be adhered to, but frequently the treatment used must be changed a number of times during the handling of a particular case.

If ulceration of the lining of the ear has occurred with exposure of cartilage, the case will be more difficult to treat. We not only have the job of controlling the infection, but also of encouraging the healing of skin over the denuded cartilage. In many cases the condition has lasted long enough to bring about narrowing of the canal to the point where the application of drugs is nearly impossible. In many of these old cases our only chance of bringing about relief is to resort to slitting of the cartilage so as to expose the canal. We were rather hesitant to do this in our first cases because we thought there might be too much disfiguration. We now feel that when the lining of the ear is so thickened that we can not properly treat it, we will save many such cases by resorting to this operation. We not only provide drainage, but also expose the parts so that treatment is much easier.

We slit the ear on the outside with a knife, scissors or the electro-surgical needle down as far as the right angle turn toward the ear drum. We used to take out a v-shaped piece of the cartilage, but no longer find this necessary. We sew the external skin to the internal skin lining of the ear. We sew from the inside outward as that seems to allow us to get a better hold for our suture in the skin lining the ear; at least, we can insert our needle better in that manner. Sometimes the bottom of the slit gives us a little trouble in sewing. An occasional case is so badly infected that our suture line becomes infected also, and the stitches break loose. Of course, this results in delayed healing of the incision, but we have to risk such an occurrence. After the lining is exposed, we can treat the exposed ulcers much more readily than before. Drainage is greatly improved. Even if we are not able to bring about healing, after slitting the ear canal in these chronic cases, we do accomplish something. The dog is much more comfortable than before. The relief from pain is well worth the effort in many cases. The scar is not very noticeable even in prick-eared dogs.

OTORRHEA CERUMENOSA

Otorrhea cerumenosa is characterized by an excess of cerumen or wax formation in the ear canal. The symptoms are itching and the presence of an excess of wax. The wax may range in color from gray to yellow to brown. The wax in the dog's ear is rarely found to be as firm as that in the ear of man. The wax may range in consistency from soft to pasty, and even sometimes semi-fluid. If there is decomposition of the wax, the odor will be fetid. As far as we can tell, the cerum or wax glands are distributed throughout the whole lining of the ear canal. A great deal of itching accompanies an excess production of wax. In some cases the lining of the ear will be thickened and erythematous. Many cases do not recover rapidly and the condition

may last for years with intermittent periods of relief.

Treatment.—Treatment consists of cleaning the ear and applying those drugs which seem to have a tendency to lessen secretion from the skin. These are salicylic acid, resorcinol and tannic acid. If salicylic acid is used either in solution or in ointment, the percentage should be kept low, as the skin lining of the ear is more susceptible to damage from salicylic acid than the skin of other parts of the body. We have found an alcoholic solution of 1½ per cent salicylic acid and 5 per cent glycerin to be useful in controlling this condition. In our most recent case we wiped out over a tablespoonful of soft, grayish wax from one ear. The lining was slightly thickened and reddened. We applied zinc oxide ointment. The erythema subsided as did the production of wax. The dog feels much better, but will probably be brought back to us again, as he was last fall, and also last spring.

COMMENT

Before closing, I would like to stress two points. First, no one standard treatment will suffice for all cases of otorrhea; treatment should be based on what we see in the course of our examination. Second, overtreatment will delay healing nearly to as great an extent as undertreatment. Protective bland applications are valuable.

Weil's Disease (=Leptospira Icterohemorrhagiae)

The description of this disease by Weil in 1886 and the isolation of the causative spirochete by Inada and Ido[1] in 1917, followed by the work of Meyer and coworkers[2] in 1937-1939 and that of Tokuyama[3] in 1940, brings into the field of medicine an understanding of a transmissible disease of man and animals of interest in canine medicine and public health work. As stated by Meyer, progress in our understanding of this disease was hindered by its confusion with blacktongue.

Obviously, the blacktongue occurring in cities where dietary deficiency can not be incriminated has to be differentiated from this spirochetosis. The clinical similarity is confusing in the absence of laboratory tests: agglutination, blood cultures, animal inoculation, dark-field urine examination.

While the incidence of the disease remains unknown in regions where "canine pellagrins" have not been closely studied, the fact seems to be that in the handling of these subjects the small animal practitioner has a new responsibility and likewise the opportunity to throw additional light on the rôle urine of the affected subject may play in transmitting the parasite. The blacktongue-typhus-pellagra-Stuttgart victim of the canine species may, through careful studies of its urine, bring out some facts about the shedder stage of Weil's disease that would aid in checking the spread of a disease suspected of having a grave potentiality in this country.

Tokuyama *(loc. cit.)* describes twelve human cases in Hawaii with four deaths, and Meyer, working with dogs in California, found 16 cases out of 47 dogs examined.

The prevalence of pellagra-like troubles in dogs and the well-known fact that some of them do not yield to the specific preventive or curative treatment for blacktongue, warn the practitioner to study these cases with great care.

[1]Inada, R., and Ido, Y.: Hokuetsu. Igakkai, xxxii (Dec. 1917).

[2]Meyer, K. F., Stewart-Anderson, B., and Eddie, B.: Canine leptospirosis. J.A.V.M.A., xcv (Dec. 1939), pp. 710-729.

[3]Tokuyama, S.: Weil's disease (Leptospira icterohemorrhagiæ) in Hawaii, J.A.M.A., cxiv (June 1, 1940), pp. 2195-2196.

The actual number of dogs licensed in the United States as of November 1940 was 3,378,553, but there are several times that many unlicensed dogs.—*From Our Dumb Animals.*

Domestic animals are beginning to be honored by this civilization to practically the same extent as did the ancients, who not only honored but deified them. The reason is simple. They transform vegetable protein into the more digestible animal protein on a large scale and thereby amplify the nutritive value of plants.

SURGERY & OBSTETRICS

The Surgical Anatomy of the Teat of the Cow*

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THE TEAT of the cow is a membranous tube. As a passageway for milk from the lactiferous sinus to the outside world, it seems to be well adapted. In its functioning, however, it appears to be subjected to traumata which adversely affect its physiologic action.

The teat varies considerably in length. In some animals it may be but 1 in. long, while in others it may reach a length of as much as 6 or 7 in.

It varies from a cylindrical to a conical shape. The more cylindrical type may vary from less than 1 in. to more than 2 in. in diameter. The base which is at the proximal end of the conical type may be 2 to 3 in. or more in diameter, while the apical distal end is quite small.

The wall varies but little in thickness from the proximal to the distal ends. It is, in different specimens, approximately 5 to 10 mm. in thickness. The streak canal (the canal connecting the teat cistern with the outside world, called also the papillary duct) in the distal end is, according to Venzke,[1] from 8 to 14 mm. in length (about ¼ to ½ in.).

The part of the teat canal which is continuous with the lactiferous sinus varies in width as the shape of the teat varies, *i. e.*, the more conical types have wider lumina to conform with the greater diameter at this point. The thickness of the wall at this junction (No. 5 in figs. 1-6), however, appears to be about the same in the variously shaped teats.

The structure of the teat wall is quite simple; it is composed, going from the outside to the inside, of skin, muscle and connective tissue, and of mucous membrane consecutively (fig. 8).

Fig. 1. Sagittal section of a teat and adjacent wall of lactiferous sinus. Grade Jersey cow. (1) Transverse folds separating pockets in the mucous membrane of the teat wall. (2) Longitudinal folds in mucous membrane lining teat cistern. Note termination of these folds in trabeculae of lactiferous sinus. (5) Level of junction of teat and udder. A short ridge may be seen here. (6) Streak canal or papillary duct showing folds of the epidermis.

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[1] Venzke, C. E.: A histological study of the teat and gland cistern of the bovine mammary gland. J.A.V.M.A., xcvi (1940), pp. 170-175.

The skin of the teat is hairless and free from sebaceous and sudoriparous glands. It presents many folds which form a mosaic of intervening furrows. The epidermis, which is typical with its many layers of cells (fig. 8), may be pigmented throughout its extent. Often the pigment is present in the epithelium of the streak canal, terminating at the point of transition (fig. 8) to the two-layered type of the teat canal.

Figure 2. Sagittal section of teat of grade cow. (1) Transverse folds separating pockets in the mucous membrane lining the teat. (2) Three longitudinal folds which are continuous with folds in the epidermis of the streak canal. (5) Level of junction of teat and udder. (6) Folds of epidermis in streak canal.

The tissue deep beneath the epidermis is termed the papillary layer (fig. 8) of the dermis or corium. The epidermis receives from this papillary layer papillae which are characteristic of the skin in other parts of the body. These papillae are sharply delimited.

Many of the papillae (fig. 8) project far into the epidermis so that there are but relatively few epithelial cells between them and the surface. These papillae contain many capillaries (fig. 8) which often appear to lie in contact with the deepest row of epidermal cells. The proximity to the surface of the capillaries just mentioned ex-

Fig. 3. Sagittal section of teat and part of adjacent wall of lactiferous sinus. Grade Holstein cow. (1) Transverse folds separating pockets in the mucous membrane lining teat cistern. (2) Longitudinal folds originating in wall of teat and extending into lactiferous sinus where they become continuous with the trabeculae. (3) Longitudinal folds branching near distal end of teat; one branch becomes continuous with a fold of the epidermis in the teat canal. (4) A cavity opening into lactiferous sinus. (5) Level of junction of teat and udder. (6) Streak canal.

Fig. 4. Sagittal section of teat and adjacent wall of lactiferous sinus. Grade cow. (1) Transverse folds separating pockets in mucous membrane lining cistern of teat. (2) Low, somewhat undulating longitudinal folds. (5) Level of junction of teat and udder. (6) Streak canal. The folds in this specimen were produced by forcibly opening the canal.

Fig. 5. Sagittal section of teat and adjacent wall of lactiferous sinus. Grade cow. (1) Two transverse folds; the one near the apex of the teat was 1/4 in. in height. (3) Large vein. (4) Black line indicates position of circular vein. (5) Level of junction of teat and udder.

Fig. 6. Sagittal section of teat and adjacent wall of lactiferous sinus. Aged Jersey cow. (2) Longitudinal folds of mucous membrane extending from the teat into the lactiferous sinus where they become continuous with trabeculae. (4) Cavities opening into lactiferous sinus. (5) Level of junction of teat and udder. (6) Streak canal.

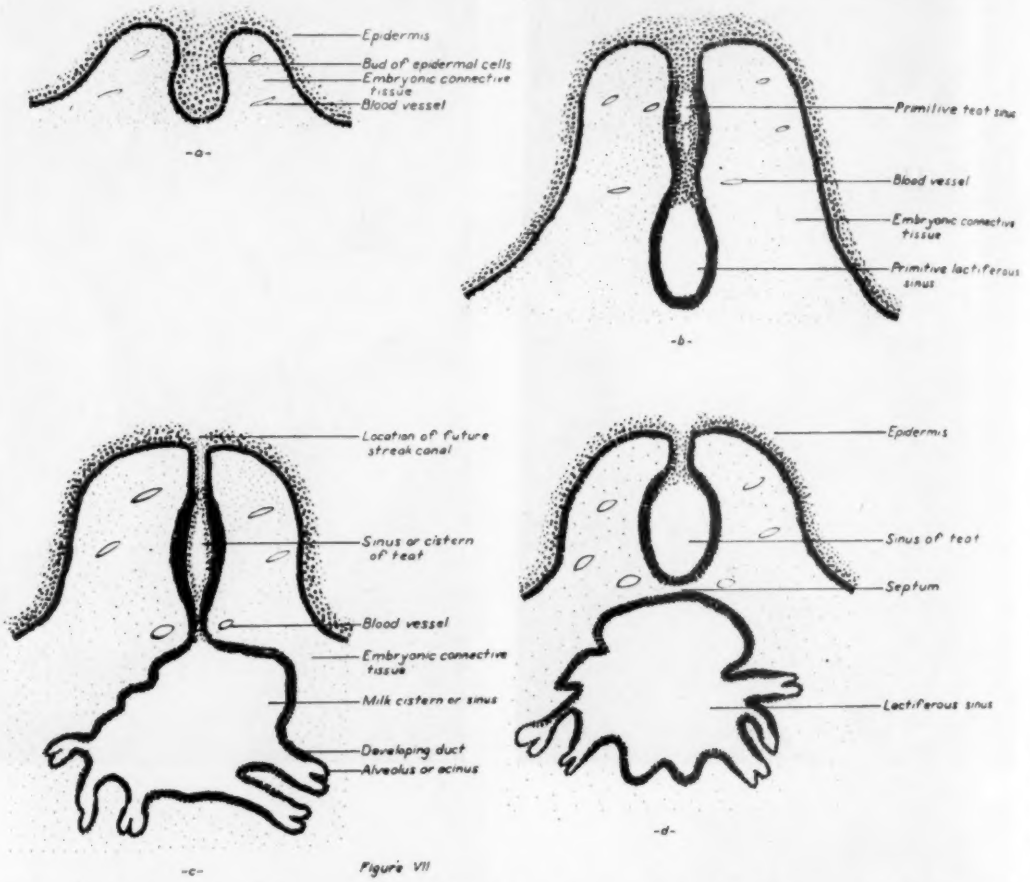

Fig. 7. Schematic drawings of some stages in the embryonic development of the udder. (a) Mammary bud extends into the cutis or dermis. (b) Mammary bud lengthened, showing some canalization for the teat canal and for the lactiferous sinus. (c) Further growth of bud with enlargement of lactiferous sinus. (d) Schema of formation of septum between teat and milk sinuses.

plains the ease with which slight injury to the epidermis results in bleeding. There may be many leucocytes in the tissue immediately contiguous to these capillaries. The connective tissue of the papillae is of a loose type (fig. 8) and contains nerve terminations. The cells of the connective tissue are large with rounded nuclei. These cells would appear to be relatively not far removed from the embryonic type and should respond quickly to stimuli, such as traumata, in multiplying and in the production of new connective or scar tissue.

The next layer of the skin, called the reticular layer, forms a relatively narrow strip between the papillary layer of the skin and the muscular portion of the teat wall. It is composed of a coarser type of connective tissue. The fibers often form dense bundles. In this layer there is considerable smooth or involuntary muscle. It, too, is in bundles which appear to be relatively short. The greater part of these muscular bundles is longitudinally arranged.

The intermediate or muscular layer (fig. 8) of the teat is composed of bundles of smooth muscle and of bundles of collagenous fibers. Superficially the bundles have largely a longitudinal direction while in the deeper portions the bundles are more and more of the circular type. About the streak canal the circular muscle is espe-

[2] Kitt, Th.: Zur Kenntnis der Milchdrüsenpapillen unseren Haustiere. Deut. Zeit. f. Tiermed., viii (1882), pp. 245-269.

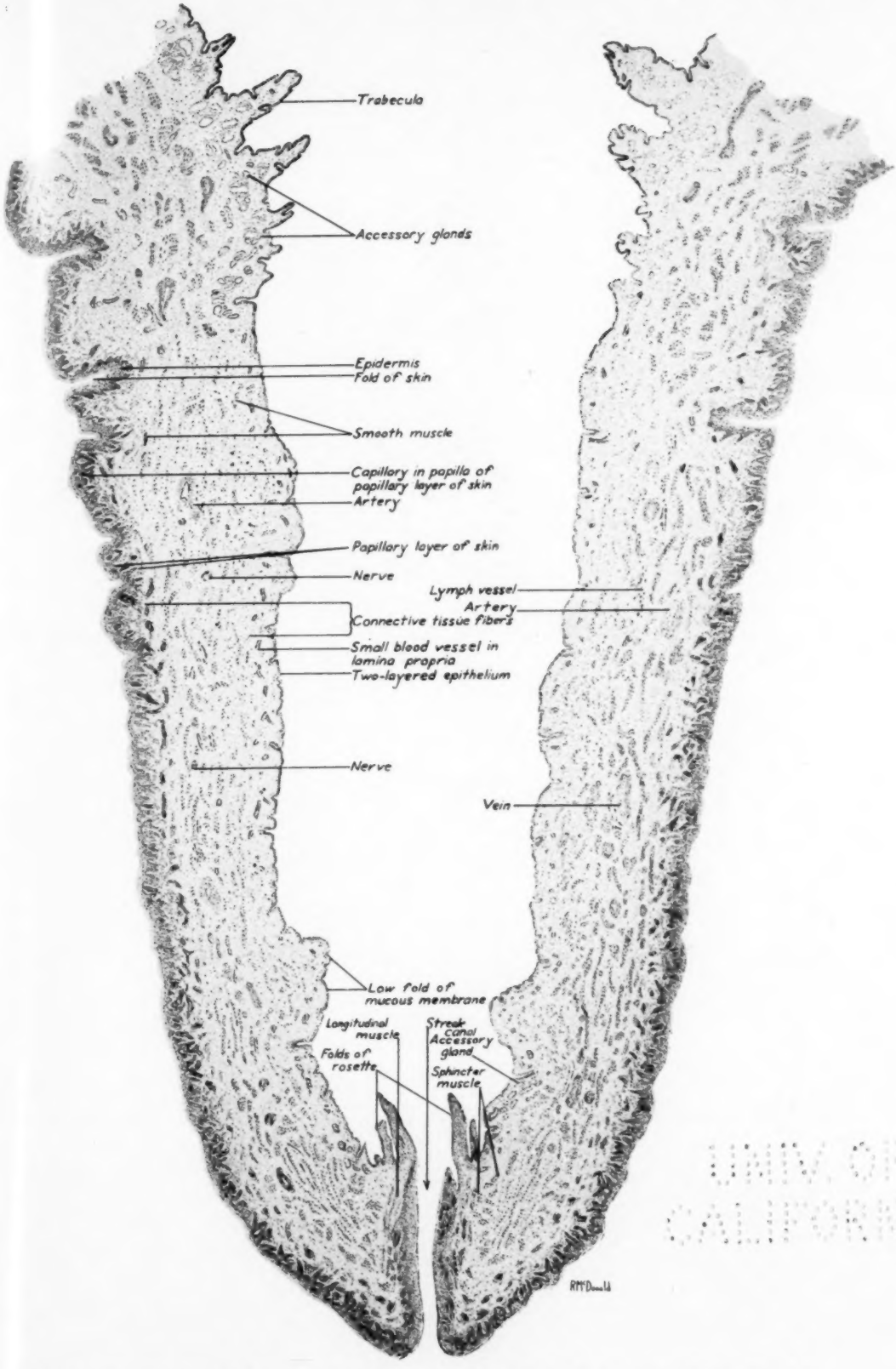

Fig. 8. Drawing of sagittal section of the teat to show detailed structure. Somewhat schematic.

cially heavy, forming a sphincter (fig. 8) for this canal. Many of the bundles appear to have an oblique direction. Kitt[2] considered that the muscle functioned in the production of folds in the skin and mucous membrane.

In the intermediate layer are large numbers of blood and lymph vessels and nerves (fig. 8). Tagand[3] has given to the great lymphatic plexus of the teat a property of a lymphatic corpus cavernosum which becomes turgescent in the cow's teat during sucking and manipulation. About these vessels there are frequently found large numbers of leucocytes. The veins are especially characterized by their large size and thick walls. This peculiarity has been observed previously (Riederer,[4] Käppeli,[5] Zietschmann,[6] Rubeli[7]). In the material upon which this paper is based, the arteries of the teats show no elastic lamina in the tunica interna.

The mucous membrane lining the lactiferous duct or teat canal deserves special mention. One of the most striking things seen upon opening the canal is the large number of folds. These folds vary in height from microscopic size to very prominent ones. There are two general directions in which these folds extend: longitudinally and transversely to the long axis of the teat.

The longitudinal folds usually number three or more (figs. 1-6). Many of these begin as folds in the streak canal (figs. 2 and 3) and then extend from the rosette (Venzke[1]) through the teat canal and terminate in the lactiferous sinus (milk cistern) (figs. 1, 3 and 6). The method of termination in the milk cistern is interesting. These folds do not simply fade out, but appear to become continuous with trabeculae (figs. 1, 3, 4 and 6) in the milk sinus or cistern. Many of these folds are so high that they form ridges (figs. 1-4).

The folds which run transversely are generally somewhat lower than those just described. Sometimes these transverse folds may reach the remarkable height of 6 mm. (¼ in.) (No. 1, fig. 5), thus forming partial partitions in the teat canal. Most of these folds, however, are relatively low and extend between the longitudinal folds and form rows of multi-pockets (figs. 1-6). Many of these so-called transverse folds run in oblique directions, adding to the complexity of the multilocular spaces between the longitudinal folds. At the rosette of the wall of the teat cistern there are some low folds (fig. 8) which, according to Venzke,[1] "radiate in all directions." At the proximal end of the teat cistern the trabeculae of the lactiferous sinus (milk cistern) become evident in the form of low folds (fig. 4). There is a gradual increase in size of the trabeculae, as one goes proximally, and also an increase in size of the spaces between them (fig. 6).

There may be, according to Venzke,[1] a large circular or transverse fold which marks the junction (fig. 1, No. 5) between the teat canal and the milk cistern, but this condition is rare. Rubeli[7] describes an annular fold here which would hinder the flow of milk. In a large number of udders of slaughtered dairy cows examined at a packing plant by us, there was none in which there was a fold prominent enough to provide an occluding sphincter. At this level, however, there are frequently found vessels coursing circularly in the folds of the mucous membrane. Such vessels may run for but a short distance while others may extend around one half (fig. 5) or more of the circumference. Number 4 of figure 5, showing the position of a vessel marked with India ink along a fold, illustrates the course of a vein which could readily be seen through the mucous membrane in the fresh specimen after it had been split open. Such arrangements of vessels at this level have been described

[3] Tagand, R.: Anatomie des vaisseaux mammaires. Le Lait, xii (1932), pp. 881-893.

[4] Riederer, Th.: Über den Bau der papilla mammae des Rindes. Arch. f. wiss. u. prakt. Tier., xxix (1903), pp. 593-625.

[5] Käppeli, F.: Über Zitzen-und Zisternverhaltnisse der Haussaugetiere. 4. Beitrag zur Bau und zur Entwicklung von Hautorganen bei Saugetieren. Inaug. Diss., Zurich (1918). Reviewed by O. Zietschmann in Jahrsber. d. Vet. Med., xxxviii (1921), pp. 111-112.

[6] Zietschmann, O.: Bau und Funktion der Milchdrüse. In W. Grimmer: Lehrbuch der Chemie und Physiologie der Milch (Paul Parey, Berlin, 1926), pp. 1-35.

[7] Rubeli, O.: Besonderheitenim Ausführungsgangssystem des Kuheuters. Verhandl. d. Schweiz. Naturforsch. Gessell., II. Teil: pp. 213-216 (1914).

by Martin and Schauder,[8] Ellenberger and Baum,[9] Riederer,[4] Fürstenberg,[10] Rubeli,[11] and Zietschmann.[12] Zietschmann[12] applied the term "circulus venosus papillaris" to these vessels. These circular vessels were said by Fürstenberg[10] and Zietschmann[6, 12] to be related to the functioning of the adjacent vascular plexuses as erectile tissue. Since a sphincter-like shelf may often be palpated at the base of the teat in the living cow, its presence might be explained by a swelling of the folds at this level as a result of the filling of these circularly arranged veins.

Veterinarians find frequently in heifers at the base of the teat a septum which separates the lactiferous sinus from the milk cistern of the teat. Figure 7 illustrates schematically the embryologic formation of the teat and teat canal. It will be seen that "a" of this figure shows the early epithelial in-dipping. This in-dipping cord of cells is shown as elongated in "b" together with some canalization for the teat canal and for the lactiferous sinus. Further, "c" presents later stages of canalization. The last sketch in figure 7, "d," shows canalization for the teat canal and for the lactiferous sinus, but it is shown that the two canals or spaces have failed to be connected by an opening. At the transition from teat to udder there is shown schematically a septum referred to above which separates the teat canal from the lactiferous sinus. The sketches for the normal developmental stages are based upon the work of Zschohke,[13] Rein,[14] Turner,[15] and Wirz,[16] while the sketch figure 7 "d" illustrates a possible method of formation of the so-called septum at the base of the teat.

The structure of the mucous membrane of the teat canal should receive much study from the standpoint of its reaction to irritations, such as the act of removal of milk by sucking, by hand milking, by the use of milking machines, and by exposure to cold, by injuries from traumata such as blows, kicks, and by surgical instrumentation.

This multifolded membrane (figs. 1-6) is composed of an epithelium which lines the lactiferous canal of the teat. There are two layers (fig. 8) in this epithelium, a layer of tall columnar cells facing the lumen and resting on a second layer of quite low cells which may vary from cuboidal to flat. Venzke[1] says these epithelial cells lie upon a thin basement membrane. Between the intermediate layer of the teat and the basement membrane is a layer of connective tissue of varying thickness which may be called the lamina propria. Since there is no muscularis mucosae to demarcate a tunica submucosae, the term "lamina propria" will be applied to this entire layer of connective tissue.

The structure of the lamina propria immediately deep to the basement membrane is similar to that of the papillary layer of the skin. Its loose connective tissue contains many capillaries (fig. 8) about which are frequently large numbers of leucocytes. These capillaries form a great plexus to which has been attributed erectile-tissue-like properties by Fürstenberg.[10] The part adjacent as it becomes continuous with the middle layer of the teat wall becomes denser and contains bundles of col-

[8] Martin, P., and Schauder, W: Lehrbuch der Anatomie der Haustiere III. Band, III. Teil. Schickhardt & Ebner, Stuttgart (1938).

[9] Ellenberger, W., and Baum, H.: Handbuch der vergleichenden Anatomie der Haustiere (Julius Springer, Berlin, 1926).

[10] Fürstenberg, M. H. F.: Die Milchdrüsen der Kuh (Wilhelm Engelmann, Leipzig, 1868).

[11] Rubeli, O.: Über einige anatomische Verhältnisse des Rindseuters und deren Bedeutung für die Physiologie und Pathologie. Schweiz. Arch. f. Tier., lviii (1916), pp. 357-369.

[12] Zietschmann, O.: Zirkulations verhältnisse des Euters einer Kuh. Deut. Tier. Wochnschr., xxv (1917), pp. 361-365, 371-375.

[13] Zschohke, M.: Die Entwicklung des Ausführungsgangssystems der Milchdrüse (Rind). Arch. f. mikr. Anat., xcili (1919), pp. 184-209.

[14] Rein, G.: Untersuchungen über die embryonale Entwicklungsgeschichte der Milchdruse I. Arch. f. mikr. Anat., xx (1882), pp. 431-501.

[15] Turner, C. W.: The Comparative Anatomy of the Mammary Glands (University Cooperative Store, Columbia, Mo., 1939).

[16] Wirz, O.: Das Hohlraumsystem der Milchdrüse beim Rind. Arch. f. wiss. u. prakt. Tier., xxxix (1913), pp. 375-421.

lagenous fibers. The blood vessels, too, become larger. In the lamina propria, both at the proximal end of the teat canal and at the level of the rosette, are accessory glands (fig. 8). Venzke[1] has given a description of their structure.

The mucous membrane of the streak canal (papillary duct) has longitudinal folds some of which are continuous with those of the mucosa lining the cistern of the teat (No. 6, figs. 2 and 3). The epithelium of the streak canal is multilayered, but even so may be considered microscopic in thickness. Its transition to the two-layered type of the teat canal occurs abruptly (Venzke[1]) in the lumen of the rosette. Under the epithelial layer are thick papillary and reticular layers, thus forming a heavy mass of connective tissue upon which the epithelium lies. The sphincter (fig. 8) of the streak canal is separated by some longitudinally coursing smooth-muscle bundles from the deeper part of these layers of connective tissue. The complexity of the folds of the mucous membrane in the cistern of the teat, the peculiarity of its structure—it being composed of a very thin two-layered epithelium and a lamina propria of a young type of connective tissue—make it especially subject to injury. The apparent rarity of cancerous growths in the mammary gland of cattle is, however, noteworthy. Swett, Matthew and Graves[17] recently reported that of 418 udders examined by their technic, no evidence of malignant growths was found. Apparently, however, the mucous membrane responds to an injury very quickly in the multiplication of epithelial and connective tissue cells which may produce bizarre-shaped growths which occlude the lumen of the teat to varying degrees. The readiness with which connective tissue reacts to irritation in the formation of scar tissue well explains the disastrous results which often follow wounds in this region.

[17] Swett, W. W., Matthews, C. A., and Graves, R. R.: Extreme rarity of cancer in the cow's udder: a negative finding of vital interest to the dairy industry and to the consumer. J. Dairy Sci., xxiii (1940), pp. 437-446.

Treatment of Tetanus

Systematic sedation, antitoxin, conservative surgery, and the maintenance of adequate fluid and caloric intake is the combination of treatments stressed in the treatment of tetanus. Avertin, sodium amytal and amylene hydrate are the types of sedatives to employ. The object is to keep the muscular contractions under constant control and thus prevent the asphyxial spasms. The antitoxin is always indicated regardless of the duration of the disease. It is given intravenously. Intrathecal administration is rejected since it may cause excitement, serum meningitis and/or medullary edema. Patients with convulsions are given large doses, one half intravenously and the other half intramuscularly. In the absence of any convulsions repeated small doses are given.

Except to remove splinters, surgical exploration is not justifiable. In no case should surgery be resorted to before sedatives and antitoxin have been administered. Active immunization by means of tetanus toxoid is highly recommended. [*Current Comment, J.A.M.A., cxv (Oct. 15, 1940), p. 1368.*]

Two successful cesarean operations in cows attributed to the free use of sulfanilamide are reported by M. L. Dietrich of Newton, Kan.

The prolonged use of sulfanilamide may produce an anemia that will interfere with the healing of wounds of grave surgical operations. The danger is overcome by postponing the operation until normal red cell levels are restored.

Irrigating a soiled wound with ordinary tap water for prolonged periods will sterilize it to better advantage than a brief antiseptic washing. The famous Carrel-Dakin wound irrigation of World War days is now believed to be quite as useful when the chlorine is left out. For fresh wounds strong antiseptic solutions are definitely outmoded.

CLINICAL DATA

Based upon the average consumption of salt by sheep and cattle, the intake of iodine from iodized block salt during the entire period of gestation would be approximately 2½ grains for sheep and 27 grains for cattle.—*Quin.*

The administration of reduced iron for anemia in pigs is not without danger. Pigs with poor resistance or those suffering from a subclinical infection may succumb rapidly to an overdose.—*From the 1939 report of Ontario Veterinary College.*

The value of sulfanilamide as a prophylactic drug in scarlet fever was shown by C. B. McLaughlin (*Journal of the Tennessee Medical Association,* xxxii, 1940, p. 223). Of 65 exposed subjects so treated, none contracted the disease. J. A. Cameron of the Chicago Union Stock Yards found sulfanilamide to have considerable preventive value in equine shipping infections.

Blood Powder

Dried blood dissolved for use may replace whole blood in making transfusions, just as blood plasma has already replaced it to some extent.

Since the main purpose of blood transfusion is to increase the volume of fluid in the large vessels, a solution of dried blood answers the purpose, and because it is more easily transported and stored, the new product is preferable.

The use of blood plasma in lieu of whole blood was reported to be effective at the meeting of the Association of Military Surgeons in Cleveland (Oct. 1940), where it was announced that dried blood plasma was developed at the Bryn Mawr (Pa.) Hospital.

Quantity production of blood powder requires voluntary donors.

Avitaminosis B

From what is coming to light about the vitamin B complex, there is little doubt that an insufficient amount of this factor is contained in the regular rations of man and higher animals. The deficiency syndrome runs through the whole gamut of nervous and asthenic symptoms: irritability, depression, fatigue, inappetence, constipation, convulsions, paralysis, heart failure, hysteria.

Of the twelve fractions of vitamin B now known, five have been produced in crystalline form: nicotinic acid, thiamin chloride, riboflavin, pyridoxin and pantothenic acid.

Clinical Tuberculosis in Animals

With the eradication of tuberculosis in domestic animals, which is accomplished by the prompt removal of infected subjects in the early stages of the disease, clinical tuberculosis has become so rare that little thought is given to it in the routine of veterinary practice. Consequently, there is found no reason to delve deeply into the pathogenesis and semiology of advanced cases either in the college course or our literature. Such topics as bronchial obstruction, extensive calcification, pyogenic invasions, tuberculous toxemia, pulmonary hemorrhage, thoracoplasty, immobilization of the lungs by pressure, aspiration of tuberculous cavities, tuberculous organs and joints, and many others are not included in the scope of our teachings. We know tuberculosis mainly as a disease detected in the incipient stages by the tuberculin test and by hunting out the minute evidence *post mortem* in the abattoir. Advanced tuberculosis in the large domestic animals of the United States is a rare disease since tuberculous cattle were removed from the milk sheds of our cities.

Anaplasmosis Recognized in Ohio*

L. W. GOSS, V.S., J. W. MILLS, A.B., D.V.M., and W. F. GUARD, D.V.M.
Columbus, Ohio

A HERD of Hereford cattle were shipped from Texas to a farm near West Mansfield, Ohio, in the spring of 1939. They were fed ensilage and ground corn during the winter months and in the early part of April 1940 were dehorned. In the fore part of May they were turned out to pasture and on May 14 the owner found one cow dead. Suspecting poisonous plants, he immediately changed pastures and lost four more within the next two days. On May 15, arrangements were made to send one of these cattle to the Veterinary Clinic of The Ohio State University for observation. It died en route and an autopsy was held. The following morning another animal was sick and it was brought to the hospital alive, and lived four days, thereby affording us ample opportunity to observe the symptoms.

The mucous membranes were very pale and icteric. The temperature was 102.6° F. and the pulse, 120. Respirations were rapid. There were muscle tremors, a serous discharge from the eyes and nose, a fetid odor from the mouth, and the animal had a dejected appearance. The hair was covered with dew-like moisture from the shoulders to the tail. The animal would drink some water but refused to eat. Feces in the rectum were dry and somewhat hard.

The blood picture showed a color index of 0.4, and an erythrocyte count of 1,480,000, hemoglobin 12.9 per cent, icterus index of 50. The leucocyte count was 12,100, of which 58 per cent were polymorphonuclear, 39 per cent lymphocyte, 1 per cent monocyte and 2 per cent eosinophile, and a few nucleated erythrocytes. *Anaplasma marginale* was observed in many of the erythrocytes. The following day the temperature had dropped to 99.8° F. and the icterus was more pronounced. The erythrocyte count was 1,160,000, and hemoglobin was too low to be read. Many nucleated erythrocytes were found in the blood smear.

The condition of the animal became gradually worse and it died on May 20.

The following postmortem observations were made on both cattle:

1) Mucous membranes anemic and icteric.

2) Generalized icterus throughout all tissues of the body.

3) Lymph glands edematous.

4) Spleen enlarged, soft and reddish brown.

5) Liver enlarged and yellow; on sectioning showed the presence of bile pigment, albuminous and fatty degeneration.

6) Gall bladder distended with a thick, greenish-brown bile.

7) Subserous hemorrhage.

8) Endocardial hemorrhage and cloudy swelling of the heart.

We believe this report is of importance in that it may encourage others to watch for this disease, especially where cattle have been shipped in from infected areas. We suggest that veterinarians obtain circular No. 154, U. S. Department of Agriculture, Washington, D. C. According to a letter from John R. Mohler, "The malady had been diagnosed in twenty-one states prior to the outbreak in Ohio. . . . Many cases such as the one reported by you have come to the attention of the Bureau where anaplasmosis developed in a number of animals following dehorning. It is known that saws or other instruments used in the dehorning operation which have not been thoroughly cleaned and disinfected between operations have been responsible for the transmission of the disease. Therefore, the owner of the herd in question and his veterinarian should be instructed to use every precaution in sterilizing whatever instruments they may have occasion to use on any cattle on the premises."

*From the College of Veterinary Medicine, The Ohio State University; presented before the Section on Sanitary Science and Food Hygiene at the 77th annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

The Clinical Use of Staphylococcus Vaccine

L. R. BARTO, V.M.D.
Basking Ridge, N. J.

OUR LATEST recognized armamentarium for the treatment of acute staphylococcic infections is the chemotherapeutic agent known as sulfathiazole. In this paper, however, the writer will not refer to acute streptococcic infections, but to the so-called chronic staphylococcic variety of clinical maladies. In this type of infection sulfathiazole is considered of little value, although it has been the writer's experience that vaccine combined with local medication renders fruitful results.

LEUCORRHEA

Undoubtedly every practitioner occasionally encounters a case presented with a catarrhal discharge from the vulva known as leucorrhea. This may be primarily a vulvitis, in which case the vulva is swollen, bearing numerous minute fistulae oozing a yellow to brownish discharge. The vulva is often bluish yellow. The condition may not be a vulvitis, but, rather, a vaginitis, in which case the vulva may or may not appear normal. Last but not least, exploration with a vaginal speculum may reveal a catarrhal cervicitis. Not infrequently all three conditions exist in the same patient.

In either vulvitis or vaginitis the parts are irrigated with Dakin's solution, and 0.5 cc. of staphylococcus vaccine or toxoid is given. The latter is repeated every four or five days, with an additional 0.5 cc. being given each time. Irrigation is generally not repeated. Where cervicitis also or alone exists, a speculum is used and the cervix is cauterized with 10 per cent silver nitrate. A thin swab is used to enter the cervical canal. Entrance is easy when inflammation exists. This cauterization is usually not repeated. Vaccination is the same as outlined above and is continued for five or six doses. It is well to have a culture made from a swab on valuable animals, or on animals of ordinary value if the owner can afford this expense. Invariably a pure culture of *Staphylococcus albus* or *aureus* is isolated.

INFLAMMATION OF THE TOE-NAIL ROOT

Onechia, or inflammation of the root of a toe nail, commonly results from trauma or a broken nail or from penetration of the toe by some foreign body. These infections quite often result in loss of the nail or even of the toe. Culturing usually reveals a staphylococcic infection. Vaccination is begun when first observed, since several days will elapse before a diagnosis is reported from a culturing. In addition to the vaccine, one may resort to local treatment in the form of antiphlogistine, hot magnesium sulfate soaking, lancing if abscess forms, etc. Vaccine is given every four or five days, the dose being increased 0.5 cc. each time for five or six injections. In cases where there is a delay before treatment is initiated, vaccine brings about early healing and controls extension of infection even though amputation of the nail or toe is necessary.

PEDAL FURUNCULOSIS

In cases of furunculosis or fistulous swelling of the toes of one or all four feet, the elbows and hocks, culturing usually reveals a pure strain of staphylococcus. These swellings are painful and present minute fistulous tracts discharging a brownish yellow pus. The writer has had little success with any local medication. Recently treatment has been confined to injections of staphylococcus toxoid, beginning with 0.5 cc. and repeating every three to four days, increasing 0.5 cc. each time. It may be necessary to continue for ten injections, the last of which would be 5 cc. Urine, fecal and blood analyses are necessary in these cases to eliminate complicating dis-

eases. Nephritis has caused or been accompanied by swelling of the feet. The same is true of filariasis. Needless to say, these cases will not respond to vaccine alone.

CATARRHAL OTORRHEA

Catarrhal otorrhea, if caused by a staphylococcus infection, will respond more readily if local treatment is accompanied by vaccine. The writer advises culturing all stubborn ear infections, since these maladies often are not staphylococcic infections. Where such infection does exist, however, one will be amply repaid by vaccinating.

SKIN AFFECTIONS

Skin ulcers and pustular eczema are the type of cases that are shifted from one veterinarian to another with but temporary results. Local applications have brought relief but when discontinued the malady recurs. Skin ulcers appear in one or more areas usually varying in size from a nickel to a half dollar. Such areas are thickened from productive inflammation caused by scratching, licking or biting. The sores usually are red, and weep. Applications to dry them result only in renewed damage when the animal bites or scratches. Bandaging induces partial healing, but the sores reopen when medication is discontinued. Quite often the patient has a harsh, dry thin coat. Small pustules break here and there over the body, leaving a minute dry scab. One may see only one pustule at a time, thereby tending to overlook or minimize its significance. There is constant pruritus. Staphylococcus toxoid plus some soothing application to the body can be given to good advantage in these cases. The writer has found novoxil an excellent application for the ulcers with or without bandaging, depending upon the location. For the rest of the body some medicated oil is indicated, such as sulfur, olive oil and oil of cade. After a course of local treatment plus the vaccine the animal usually gains in weight and develops a thick, healthy coat blemished only by scars where ulcers existed.

Fresh Eggs (= Edible Eggs)

A study of the reason that good eggs at breakfast have replaced the poor ones of but a few years ago takes one into veterinary science. Few realize that the production and distribution of good eggs has been the main factor in the development of the billion-dollar poultry industry of which we speak in encouraging practitioners to interest themselves in poultry medicine.

The old saying, "Three eggs, two (too) bad," was based upon truth. There was no telling how many eggs in a given dozen were edible. Today, the term "fresh eggs" rings true. Inedible eggs have almost entirely passed out of the market and the consequence is that egg consumption has increased.

But what is significant to the veterinary profession in this respect is that the increment was brought about primarily through the researches on poultry diseases which have stabilized large-scale poultry production. Better breeding, better housing, better feeding, better sanitation and general improvement in storage and marketing could not have taken form without first controlling diseases. Poultry science has made long strides in recent years and its application is improving; the production of poultry, just like that of other farm animals, is rapidly passing from the nostrum to the scientific period of development.

For the part the veterinary profession has played in the transformation one must look to the work of the United States Live Stock Sanitary Association, the American Veterinary Medical Association, animal pathologists of agricultural experiment stations, the veterinary colleges, the state and local associations, and the federal and state regulatory services. These are the agencies which have put fresh eggs on the breakfast table and which will insure a prosperous future for poultrymen.

A veterinarian can not limit his responsibility to his clients by contract so as not to be liable for his own negligence or that of his employés.—*Kotz.*

The Immunizing Value of the Blood Clot of Hyperimmunized Animals

When an animal is bled and the serum is allowed to decant the proportion of serum obtained varies between 40 and 50 per cent according to the species of animal and the method of separating it. The clot contains red and white blood cells and also a certain quantity of serum that may be worth considering. Moreover, relatively recent experiments have shown that the red cells possess the property of absorbing virus, bacteria and antigens circulating in the blood[1]. In the attempt to obtain more of the specific serum against canine distemper (Carré's disease) the authors tried to verify in the cadre of that disease, the power the red cells have in absorbing the specific antibodies.

Recently two Russian authors, P. A. Boulanov and V. Rikowsky[2] assuming that the body has the capacity of producing antibodies only through cells of mesoblastic origin and that it is possible that they (antibodies) formed in the figured elements of the blood as well as in other cells of the same origin, attempted to obtain a liquid from the blood cells possessing the properties of antiserum and capable of replacing it. To obtain this liquid the authors used the blood of horses hyperimmunized against anthrax. The blood of these animals was kept in flasks at room temperature until separation of the serum was complete. The serum was then aspirated and mixed with 3 per cent phenol. The coagulum remaining was shaken energetically for 15 minutes in the same flasks whereupon physiological salt solution was added. To facilitate extraction the flasks were left at room temperature for 24 hours, filtered through gauze and Berkefeld bougie, and conserved like serum with a solution of 3 per cent phenol.

The titration was effected on rabbits. The authors concluded:—

1. The blood clots prepared from the blood of an animal immunized against anthrax possesses immunizing properties;

2. the liquid is no less active than the serum;

3. the preparation of such a liquid reduces the production expense and augments the amount produced.

Based upon these experiments, the authors attempted to obtain from red blood cells (which are thrown away in the preparation of specific serums), an immunizing liquid against canine distemper.

Preparation of the Extract—Dogs hyperimunized in the usual manner were used. The serum was collected by decantation. The clot remaining in the flask was mixed with physiological salt solution amounting to one half of the quantity of the serum removed. The mixture was energetically stirred and shaken and left 24 hours in the refrigerator. The liquid obtained by centrifuging is limpid red. It was then formulated (1%) and incubated at 56° C. for two days.

Titration on Ferrets—One ferret resisted 1 mg. of virus after receiving 1 mg. of the blood-cell extract; 1 ferret died of 10 mg. of virus after receiving 1 cc. of the extract; 1 ferret resisted 10 mg. of virus after receiving 2 cc. of the extract; 1 ferret resisted 2 mg. of virus after receiving 1 cc. of extract; and 1 ferret died of 2 mg. of virus after receiving 1 cc. of the extract.

As is customary in the titration of specific serums the doses in these experiments were 1,000 to 10,000 times the minimum mortal doses. The results were, therefore, excellent.

The Practical Results—Tests of the therapeutic value of such products have been made on dogs affected with the natural disease, at the Alfort clinic, during the months of September and October, 1936.

*P. Goret and E. Lelandais. De l'utilisation des caillots de sang issu d'animaux hyperimmunises. Bulletin de l'Académie Vétérinaire de France.

[1]Dujarric de la Rivière et Kossovitch (N), Annales de l' Institute Pasteur, 1930, xlv, 107.
Ibid. Annales de l'Institute Pasteur, li, 149.
Ibid. Compte rendu de la Société de Biologie, 1927, xcii, 373 and 1934, cxv, 1459.
R. Branner and E. Soru. Compte rendu de la Société de Biologie, 1932, xvii, 859.
Ibid. 1933, cxiv, 312.

[2]P. A. Boulanov and V. Rikowsky. Sovetskaia Veterinaria, 1935, No. 12, p. 48.

Symptomatic treatment, except in several cases, was not neglected. The dose of the red-cell extract was 20 cc: 10 cc. subcutaneously and 10 cc. intramuscularly at the thigh. The animals were examined two to three days after receiving the injection and the results checked again after a month or two.

(The authors tabulate the result in 23 cases.)

Of 23 cases treated 16 recovered and 7 died. Of the latter 2 were sacrificed before the results could be judged. Of the 16 recoveries, two were rapid and occurred without any symptomatic medication. In general when employed early, the extract provoked early amelioration. The authors do not claim that the blood-cell extract is superior or even quite as effective as the serum-alone product.

Modified Human Influenza Virus Promising

A virus for human influenza modified by passages through ferrets, comparable in kind and in principle with the modified canine distemper virus that is now under investigation by the U. S. Bureau of Animal Industry for immunizing dogs against distemper, is the subject of a nationwide newspaper release. It is a polyvalent vaccine produced by The Rockefeller Institute for Medical Research. The vaccine was tested in Puerto Rico in an epidemic of 100,000 cases, and on about 300 persons in this country. The product, which was discovered by Drs. Frank L. Horsfall, Jr., and Edwin H. Lenette, can be produced in unlimited quantities—sufficient to vaccinate whole populations. From the more or less confusing reports coming through, the vaccine is a mixture of human influenza virus and canine distemper virus passed through ferrets. It is produced from the lung tissue and spleens of ferrets inoculated with both of these viruses, the reports announce.

In a communication to *Science*, the discoverers admit that some difficulties arising from the variations in virulence of the two viruses have yet to be overcome, since on that account some of the preparations were ineffective.

Sulfanilamide and Nicotinic Acid

Announcements that nicotinic acid overcomes the toxic effects of sulfanilamide are probably in error. At least, the results obtained are contradictory. Studies of this question at the Johns Hopkins Hospital show that while benefits were observed in certain cases, there was absolutely no effect obtained in others. In reply to a query about combining nicotinic acid with sulfanilamide in a tablet, *The Journal of the American Medical Association* says that the combination "would not appear to be based upon sound clinical evidence."

Certified Milk Makes Good Showing

Reports to the effect that the demand for certified milk is decreasing are not true, according to E. A. Woelffer,* D.V.M., president of the Certified Milk Producers Association. While in the last ten years certain producers were taken off the list for not living up to certified milk standards and for other reasons, the consumption of that grade of milk has held up remarkably well considering that it has been sold against widely advertised grades in recent years. The quartage for 1932 was 34,226,480 and, while it did drop away down to 23,000,000 by 1934, the figure for 1939 was 36,000,000. This, to Dr. Woelffer, is encouraging.

Ménière's disease (= aural vertigo), an inflammatory state of the middle ear manifested by fainting spells and various ear and eye disturbances, was found to yield to intravenous injections of histamine, by Dr. Horton of the Mayo Clinic.—*From Science News Letter.*

Though famine stalks in some parts of the world and experts predict food shortages in many a country, the United States with its enormous surpluses sees no such a menace on its horizon.

*Certified Milk, xv (Dec. 1940), p. 7.

EDITORIAL

Endogenous Tuberculosis Infection in Veterinary Medicine

VETERINARIANS and physicians approach the tuberculosis problem under the direction of their respective pathologists. The two differ materially in the handling of the trivial case of tuberculosis.

There is general agreement in both groups that the primary tuberculous complex (the original infection) in the young may remain the source of the secondary complex (open tuberculosis) in the adolescent and adult. The difference of opinion between physician and veterinarian lies mainly in the significance of the latent case in the program of eradication. The physician contends that during the dormant period the infected subject is not tuberculous, but admits, however, that the original lesion may become the source of what some human pathologists call "endogenous reinfection." That is to say, the dormant tuberculous process is claimed to be of no particular consequence. It is kicked into activity only by some new influence (overstrain, debility, lowered resistance) which transforms the subject into a case of active tuberculosis. To the veterinarian, this conception is a dangerous one to entertain.

It is undeniable that tuberculous lesions may insulate or heal completely, that tuberculous lesions may escape the eye in the most searching postmortem examination, that there are borderline reactions to the tuberculin test and that there are a few "no-lesion" reactors. But by none of these tokens can the practice of removing all such cases by slaughter be disapproved as unscientific and replaced by the physician's plan of trusting everything to avoiding "overstrain, debility and lowered resistance" as a means of eradicating the disease.

Bovine tuberculosis eradication in the United States, which stands out as an unusual victory for veterinary science, was accomplished by refusing to compromise with any degree of tuberculous infection that could be detected by the tuberculin test, while the physician, as Myers points out and emphasizes, goes on working more or less in vain with only the open (advanced) cases and thus leaves the basal influence developed unchecked. Figuratively speaking, while great streams of water are thrown upon the flames, the source of the fire is willfully ignored. Therein rests the difference between the physician's and the veterinarian's strategy in the war on tuberculosis.

The facile removal of the tuberculous animal and the difficulties of its counterpart in human medicine do not alter the scientific facts implicated in tuberculosis eradication in either man or animals. The principles are precisely the same. The expedience of one must not be set aside because of the inexpedience of the other. Nor should teachings to the effect that dormant tuberculous infection is of little consequence be permitted to build up a false sense of security among the American people (now that bovine tuberculosis has been practically eradicated and the disease in other species is on the way out), since the program of the future not based upon hunting for the most trivial cases and removing them forthwith would soon nullify the benefits derived from the antituberculosis campaign veterinarians have waged during the past 23 years.

For the purpose of eradication, tuberculosis is not divisible into infectious and noninfectious cases, since the infection in all of its stages and phases is but one disease—a menace to be removed by all means available.

Canine Distemper and Avitaminosis B

EXPERIMENTAL studies of avitaminosis B in foxes and clinical studies of certain phases of distemper in the domestic dog appear to indicate that a low intake of the B complex in these carnivorous animals has considerable etiological significance.

Foxes depleted of vitamin B experimentally or by food low in that factor break down with fatal generalized convulsions; and many observing practitioners in the small animal field believe that the distemper syndrome commonly charged to secondary infections is as often the result of vitamin B deficiency as of the epithelial damage done by the specific virus. That is to say, lack of vitamin B alone creates a condition that paves the way for the bacillary invaders. The absence of the cellular inclusions characteristic of virus distemper in carefully conducted postmortem examinations of dogs that died of apparently typical distemper leads to the belief that some distemper cases are not of virus origin at all, but, instead, develop from the ambient flora on the mucous membranes of the vitamin B-depleted dog.

The alleged relationship of the secondary mucitis of distemper, the one originating from the invasion of virus into the epithelial cells and the other from the same cells weakened by vitamin B depletion, makes the diagnosis of virus distemper a matter of prime importance and, besides, it suggests vitamin B therapy as a preventive and treatment.

Of particular importance is some type of reliable laboratory method that would forthwith incriminate or exempt the distemper virus at the onset or anywhere along the course of the disease. The absence of such diagnostic methods is a gap to be filled in the handling of canine distemper, for in diagnosing distemper the best practitioners disagree. Where one diagnoses distemper, the other dissents, and neither can furnish evidence to confirm his opinion.

A urinalysis that detects the presence of Carré's virus in the urine (said to be in the offing) or a blood picture known to be associated with the virus infection would be invaluable in the practice of canine medicine. Until then, practitioners will disagree and owners will be disappointed when well vaccinated dogs become sick from diseases clinically similar to true virus distemper. The "breaks" of the hog lot when cholera vaccination first came into use were explained through the years by scientific investigations which convinced swine breeders that vaccination against cholera did not protect hogs against other diseases. The refinement of canine distemper vaccination in recent years has its counterpart in the excellent work done in perfecting the immunization of hogs against cholera, but the question of "breaks" remains none too clear.

Moreover, the so-called nervous form of canine distemper is still unexplained. Whether, as in foxes, it is due to a separate specific virus, to Carré's virus, to a bacterial invasion of the central nervous system (a secondary infection), or to an avitaminosis, like Chastex paralysis of the fox, are questions open to future investigations. Meanwhile, keeping these hypotheses uppermost in mind in clinical work while scientists in the fields of nutrition and microbiology are bringing out the hidden facts is the practitioner's obligation.

The Boston Meeting of '92

At the Boston meeting of the Association in 1892, the proposal to have an exhibit at the World's Columbian Exposition (Chicago, 1893) was disapproved by the Comitia Minora, predecessor of the present Executive Board. In 1937, the Association joined with allied interests and raised $20,000 for such an exhibit at the New York World's Fair of 1939.

In 1940, the membership was approximately 6,400 and 1,237 new members were elected.

American Veterinary Journalism

THE PROGRESS of the veterinary profession in this country was slow and laborious until the circulation of our periodical literature became more general. In 1895, or 45 years ago, when veterinary education was running unmanaged and regulatory laws were being enacted under difficulty, less than 2,000 out of a total of 5,000 veterinarians in the United States subscribed for the three veterinary journals then published.*

An annual meeting of the national association that drew an attendance of 200 was called a success. State meetings attended by 20 to 40 were gratifying. Yet, the programs of both national and state associations stand out as proofs that veterinary science was not lagging behind in the advance of medicine.

Books were more popular than magazines. The magazines eked out a precarious existence. Sometimes issues were postponed from lack of money due to unpaid subscriptions and meager income from advertising. Only one of the three, the *American Veterinary Review*, survived. It was saved from bankruptcy by the AVMA when purchased in 1915 to become the Journal of the American Veterinary Medical Association.

In spite of the financial incompetency of the veterinary magazines of that period, it was these impoverished publications that kept up morale, built up association membership, recorded contemporary knowledge, and maintained an uninterrupted chain of passing events in veterinary medicine. To keep history straight in this respect, credit must be given to the defunct Missouri Valley Veterinary Association which came later as the first veterinary society in this country to publish a magazine of its own.

The private funds sunk in the development of an American periodical literature for veterinarians and the anxious hours sacrificed by the willing pioneers would justify the erection of a monument to the memory of its editors:

a) Alexander Liautard, tireless worker in the fields of education, journalism, and organization;

b) Rush Shippen Huidekoper, intrepid soldier of uplifting campaigns—builder of nation-wide affluence for veterinary science;

c) Simon J. J. Harger, keen-minded anatomist and surgeon, advocate of better veterinary literature, ahead of his day—a clinician and writer who kept science uppermost in mind;

d) W. Horace Hoskins, teacher, practitioner, editor, humane society official, and watchful guardian of professional ethics;

e) Roscoe R. Bell, skillful practitioner, writer, association worker, and advocate of confraternity.

Beyond the work of these late 19th century leaders there is little worth while to record in the history of American veterinary journalism. Before them everything in periodical literature died out from lack of general interest. The magnitude and the difficulty of their task may be traced to the rapid coming of pathogenic bacteriology which completely revolutionized therapeutics, the unregulated schools, the poverty of laws, and the dubious rating of animal doctors and their function. The power of the press is shown in the results of their labors—the fine American veterinary journals of this day and the affluence of the profession supporting them.

In a small profession such as ours with its bare 12,500, there is nothing quite as beneficial as hearty support of the profession's journals. They tell the world what you are and what you are doing. Without a liberal patronage of them the trend in the usefulness of veterinary science will be in the downward direction.

The articles and editorials of the *American Veterinary Review*, the *Journal of Comparative Medicine and Veterinary Archives* and *Veterinary Magazine* are the cornerstones of the house in which we now live. They contain the scientific facts and the constructive policies which connoted the destiny of the veterinary profession in this country. They sacrificed financial stability by not yielding to popular sanctions which would have made the publication of their

*Editorial: What is the matter with American veterinary journalism? Journal of Comparative Medicine and Veterinary Archives, xvi (Aug. 1895), p. 518.

journals a profitable undertaking. The obligation is still clear. There is no middle course for the profession to pursue. Its periodical literature governs its public adjudication and our rating in the world of science and industry. For not having yielded to popular sanctions we owe a debt to the old editors that can be repaid only by honoring their names on the pages of history.

In launching the American Journal of Veterinary Research, organized veterinary medicine is but following the teachings of its forefathers who gave freely of their money and hours to a cause the veterinarian of 1940 must not now abandon, for in the quality of its periodical literature lies the fate and respect of our profession.

Effects of the Preparedness Program

There is no doubt, judging from current developments, that the army will draw heavily upon the limited veterinary personnel of this country. Already, the few reserves who have been ordered to active duty are creating a shortage of applicants to fill positions open to qualified veterinarians in civilian pursuits. No physically fit veterinarian of military age will have to look for a job when the armies now in the process of organizing will have attained their procurement objectives in men and animals.

The fact that Canada has disbanded its veterinary corps may create an unfortunate sense of security in regard to a sufficiency of veterinary officers. The preparedness problems of the two countries are not the same. The army of the United States needs animals for training, and the food-inspection service carried out under existing regulations mounts with the increase of strength.

One thing, however, is assured. The American Veterinary Medical Association will do its utmost to aid the War Department in its tremendous undertaking. Already we have almost completed the difficult task of classifying the veterinarians of this country for the Selective Service Committee, and we have placed the mailing facilities of the Association at the government's disposal.

The Transmutation of Base Metals Into Gold

During the past 30 years, the consumption of meat decreased 30 lb. *per capita* in the United States. A movement to induce the American housewife to use more meat is being carried out by the Institute of American Meat Packers in the interest of farming and public health. The welfare of Occidental civilization, it is believed, depends a great deal upon the amount of wholesome meat the population consumes. Health, vigor, brains and stature are governed by the laboratory in the body of animals which manufactures the crude elements of plants into delectable nourishment and, at the same time, furnishes farmers the greatest outlet for their plant products. Allegorically speaking, the domestic animals of the present time have made the dream of the ancient alchemists come true on a large and ever-increasing scale. They do a lot of transmuting that economists should not overlook. The making of milk, meat and egg equivalents for the human dietary without the metabolic laboratory of plant-eating animals is not yet among the accomplishments of mankind.

From Small- to Large-Scale Duties

The difference between veterinary practice today and 25 years ago is that prophylactic medicine has become a reality, requiring more than 25 per cent of the total number of graduate veterinarians in the country. Where practically all veterinary service was limited to salvaging individual animals 25 years ago, guarding against the spread of infectious diseases both in private and public practice has become an ever-increasing field. In other words, the veterinary profession is in the "wholesale" rather than in the "retail" business and its main function is the preservation of the nation's food supply.

READERS SAY

"Provoking Statements"

To the Editor: Your editorial on pages 460-462 of the November (1940) issue has a number of provoking statements for which you offer no substantiating evidence. If conclusive evidence has been found to support the following statements, I should be glad to know of it.

(Signed) RAYMOND HAGAN
Brooklyn, N. Y.

1) Do you have statistics to show that ". . . a professional group . . . driven from . . . rural districts . . . seek a living in cities?" What are these figures like?

[*Answer*—Just how many veterinarians moved from the country to the cities in recent years can not be stated exactly, but that they were numerous is not conjecture. In the rôle of state veterinarian, W. H. Welch of Illinois, past president of the Association, called attention to whole counties and groups of counties of that important livestock state that had been left without licensed veterinarians, graduate and non-graduate, on account of moving to cities. As chairman of a board of examiners operating under the Department of Registration and Education of the same state, the editor of the JOURNAL is frequently requested by stockmen, lawyers and members of the General Assembly to grant licenses to non-graduates in order to fill these empty places. In the last ten years a preponderance of the applicants recently graduated stated they were going into small animal practice. At the last examination (December 1940) only one out of eight was going into rural practice. Entering the federal or state service accounts for some of the vacant territory, and no doubt home vaccination of hogs and other activities of the farm organizations were also factors.

Unfortunately, the veterinary profession has no fact-finding statisticians. For the first time, the Association began last year to take a census (in coöperation with the U. S. Bureau of Census) which will bring such mutations down to exact figures. Until complete, generalities based upon a broad view of the veterinary vista and longtime observation must answer the purpose.]

2) On what evidence do you base the assertion that ". . . practitioners lose interest in farm animals just as fast as their income from small animals augments?"

[*Answer*—On large-scale studies among veterinarians in the Middlewest and Pacific Coast. For a practical answer one needs only to envisage a trip in a snowstorm to a cold country stable for about the same fee as would be earned for a few minutes of pleasant work in a warm small animal hospital. The two types of practice are manifestly incompatible on almost every score: knowledge and technics, character of clients and patients, office hours, equipment *et al*, too numerous to mention.

The direct question has been asked of numerous veterinarians, over a period of years. Without exception, the assertion was confirmed. Moreover, an Association 78 years old that has published monthly a journal since 1877 naturally forms definite opinions of considerable value on fundamental questions. Its understanding of such matters is apt to be broad and essentially correct.]

3) What epizoötics are these "in France which German and French veterinarians are striving in vain to subdue, and do you refer to occupied or unoccupied France?"

[*Answer*—The diseases were not mentioned in the widely circulated press (AP) reports. Obviously, foot and mouth disease was one of them. Presuming that the Germans would not interfere with animal diseases in unoccupied territory, the dispatch no doubt referred to occupied ter-

ritory. No French veterinary journals have been received at this office for a long while.]

4) How do you know that these epizoötics are due to "absent veterinary service" and not to the general breakdown in the regular life of the community?

[*Answer*—The question answers itself. "The general breakdown in the regular life of the community" would certainly include breaking down of the normal operations of the veterinary service. Whether the veterinarians were absent in fact or not carrying out their regular function, the results would be the same. Infectious diseases of animals in a country as thickly populated with animals as France would soon become a serious drain on the country's food supply. It would be unfortunate just now for veterinarians to wonder whether their presence and work in a community is necessary. The main program before the profession today is trying to enlighten the people on the importance of maintaining a well-deployed and well-disciplined army of animal-disease fighters. We should not feel dubious about the dire effect of "absent veterinary service" upon this civilization among ourselves, in view of the many enemies dogging scientific veterinary practice.]

[Readers are invited to read the editorial (*loc. cit.*) and write us their views. "Readers Say" is conducted for the purpose of collecting ideas on basal questions. It is a column for brickbats as well as for posies.]

Who Runs the Association?

A PRACTITIONER in Missouri writes:

> About 80 per cent of the membership of the AVMA is made up of men who earn their living in practice, but there are too many running the Association who do not safeguard the practitioners' interests. This must be changed so that the Association will stand for the man in practice against cranks and irresponsible anti-this's and anti-that's who seek to hamstring the good work of the man in the field.
>
> This must and, I believe, will be changed in time. I have always been active in local and state associations but, frankly, I have never before had any regard for the national association. Now that I have joined I shall stay in if allowed to do so, for I hope to see the day when the practitioners are united to protect themselves as all the other groups are doing.

The best way for practitioners to unite and protect themselves is by joining the national association. It is a powerful weapon for any group. The practitioners —8,000 strong — are by no means adequately represented among the 6,400 members of the Association. The percentage of members in the educational, regulatory, military, commercial and research branches is much higher than that of the practitioners. When the latter seize the opportunity open to them in sufficient numbers by participating actively in the local, state and national organizations, there will be no question about who runs the Association.

The two governing bodies of the Association are the Executive Board and the House of Representatives. The former is composed of ten members elected by mail ballot, a member-at-large elected by popular vote at an annual meeting, and the president and president-elect. The latter, who succeeds the president, is also chosen by popular vote, at each annual meeting. The delegates to the House of Representatives are chosen by the state associations, either by election or appointment. They represent the membership and their word is final. Every veterinarian who was graduated by a recognized college can, therefore, have a voice in running the veterinary affairs of the country simply by choosing these representatives wisely, and holding them responsible for their acts.

It seems important from time to time to remind the membership of this set-up, in replying to complaints that certain groups run the Association. The Association is run by those who will to do so. However, as stated in previous articles, the membership does not use its power. Organized veterinary medicine appears to be too new to be completely understood. The AVMA has furnished a perfect machine but the members of the profession have yet to learn how to run it to the best advantage.

WITH THE EDITORS

"Absent Veterinary Service"

Elsewhere in this issue is a brief commentary (*vide*, Readers Say) on the actual and probable effect of suspending the veterinary service of a nation, commonwealth or community which readers are invited to study with the view of developing the superiority complex that is lacking to a considerable extent among veterinarians who do not take time out once in a while to take a bird's eye view of our tremendous veterinary-medical problems—problems ignored only at the risk of reducing a country like the United States to the level of a subject nation. The fact that neither the livestock industry nor the veterinary profession has yet been able to remove all doubt from the contention that this civilization can carry on and maintain its present standards of living, of culture, of education and of wealth, only through resourceful attention to the domestic animal population, is one of the reasons veterinarians have such a hard row to hoe.

Bovine Brucellosis Vaccination

The article on calfhood vaccination[1] published in the January (1941) issue attracted nationwide attention. Of the plan proposed for the handling of the disease, the *Drovers* (K. C.) *Telegram* says:

> Action of the United States Live Stock Sanitary Association in approving calfhood vaccination as a means of preventing Bang's disease or contagious abortion in cattle is of interest to cattlemen throughout the country . . . the Association approved this method after hearing a favorable report on the subject by Dr. John Mohler, chief of the bureau of animal industry, at a recent meeting in Chicago. . . The development may result in the livestock industry as a whole getting together on a satisfactory program of combating the disease, which has been a source of costly losses to cattlemen. . . Although the plan to use the vaccine is not yet in the operative stage, he said that tests of calfhood vaccination under farm conditions have proved satisfactory . . . that livestock officials in the various states could best decide how calfhood vaccination could be worked into their respective programs . . . integrating it with the test and slaughter method. In tests with the vaccine [developed in experiments under the supervision of the federal bureau], treated cattle have been found to be able to mingle with infected herds and maintain almost 100 per cent immunity for at least five years.

Other press reports and editorial comments on calfhood vaccination point to its economic advantage over the test and slaughter method which in addition to the payment of large sums for indemnities tends to unduly deplete herds through the slaughter of reactors.

[1] Mohler, J. R., Wight, A. E., and O'Rear, H. M.: Calfhood vaccination as an aid in coöperative Bang's disease (= bovine brucellosis) control. J.A.V.M.A., xcviii (Jan., 1941), pp. 1-9.

The Main Function of Veterinary Societies

The practice of any branch of medicine is apt to be so abused (within the letter of the statutes) that societies have to be maintained and vigilantly operated to prevent it from actually sinking to the level of reprehensible occupations in the public eye. Letting the bars down to loose tactics would soon bring a profession like ours into disrepute in spite of the dispensations of its scientific workers. The old adage about the chain and its weak links is more applicable to veterinary medicine than to the other branches of medicine.

Those delegated to take the science of animal medicine to the farms and homes have the choice of being received as advocates of high motives or as exploiters of the canny craft which any branch of medicine becomes in the absence of its societies. In short, in bringing up the memberships of the associations and obeying the codes lies the main function of veterinary societies.

CURRENT LITERATURE

ABSTRACTS

The Modification of Rabies Virus

THE INFLUENCE of drying on the virulence of rabies virus is one of the old classics of scientific research. The basis of the initial method of vaccinating against rabies is, in fact, desiccation.

Pasteur watched the virulence of rabies virus begin to disappear on the sixth day, when the spinal cords of rabbits, dead of rabies, were exposed to drying. On the 13th to the 14th day of exposure to dry air, this pioneer of medical research saw the deadly virus of rabies lose all of its virulence. Through the development of a fixed virus in the course of some 2,000 passages from rabbit to rabbit since 1884, the modification of rabies virus to a nonpathogenic state became an established scientific fact—a veritable dogma. Although researches on rabies vaccination have multiplied as the science of immunology has advanced, not a fact, not an observation against its exactitude has been recorded. Only the mechanism of attenuation is subject to dispute.

Remlinger and Bailly, famous for their extensive studies of rabies virus and rabies vaccination, insist that desiccation does not destroy the virus. On the contrary, it is a potent factor of conservation. Drying confers to rabies virus the power to resist temperatures as high as 103° to 104° C. It has been generally believed that loss of pathogenic power brought about by Pasteur's initial method was due to the combined action of temperature (23° C.), of the oxygen of the air and the desiccation itself. The process (dehydration) confers the power to resist temperatures far above 23°. The loss of virulence is, therefore, due to something besides drying.

THE THEORY OF MATURATION

Precisely what takes place in the spinal cords of rabbits used to make rabies vaccine has been explained by the maturing of meat of freshly slaughtered animals. Animal tissues sheltered from bacteria of putrefaction at a temperature of 20° to 30° C. undergo changes, the rapidity and intensity of which depend upon the amount of moisture they contain. The action is an autodigestion due to the proteolytic ferments of the tissue cells. Though present during life, these ferments announce their presence only after death. When a tissue is removed from the body or when a part of the body is no longer living (thrombosis, compression), the ferments come into play. The result is necrosis, cytolysis, necrobiosis. Drying of spinal cords, as in the case of flesh, stops the autolysis, since a condition essential to the action of these ferments is a certain amount of humidity. This viewpoint has the advantage of resting upon a well-known phenomenon, an example of which is the maturing of meats for consumption. Muscle tissue of freshly slaughtered animals is hard and insipid. In a day or two it becomes tender and salubrious owing to autolysis of the muscle fibers. Inversely, one of the common processes in meat conservation is slicing the meat into thin layers and exposing it to the air and sun. The rapid desiccation stops the action of the proteolytic ferments and, provided it is kept free of humidity, the meat undergoes no alterations. The process of destroying the virulence of rabies virus contained in the spinal cords of the rabbits before the desiccation has completely destroyed the action of the ferments may be

credited to the admirable genius of Pasteur. The process is entirely too long and tedious to have been accidentally discovered.

As Remlinger and Bailly have pointed out, in the spinal cord of rabbits the proteolysis is intense during the first hours of exposure in the air and caustic potash of the Pasteur flacons. The activity of the ferments decreases with the rate of evaporation. The potash deprives the cords of the moisture required for their action on the ferments. Once the cords are completely dry, the proteolytic action is nil. The destruction of the virulence of the virus follows the same course. Otherwise stated, though very intense during the first hours, the virulence diminishes along with the desiccation.

THEORY AMPLY CONFIRMED

The outfit required consists of a flacon of 1.5 liters in which are placed two test tubes each containing 200 Gm. of caustic potash. The desiccation is not rapid enough to impede the proteolysis to the point of preventing action upon the virus. The desiccation is, however, complete enough to prevent bacterial contamination, which is difficult to exclude in the operation of extracting the cords. When complete desiccation of the cords is complete, the proteolysis of the virus is sufficiently advanced to entirely deprive the nervous tissue of its virulence.

The history of experimental rabies is rich in proofs of the vulnerability of rabies virus to proteolytic ferments. Centanni submitted whole brains of rabbits dead of rabies to artificial digestion. He found that 20 hours was sufficient to destroy rabies virus. Working with gastric juice gathered by fistulization of dogs, Babes and Talasesou showed that four to five hours is sufficient to render rabies virus inactive. Needless to state here, the gastric juice acts only upon protein material.

The authors also recall that when sacs of collodion are filled with rabies virus and placed in the peritoneal cavity, the virus rapidly loses its pathogenic power. Moreover, in six hours after intracerebral inoculation with this material, half of the animals resist, and in twelve hours the loss of virulence is absolute. Experimental results of this type compare badly with the resistance of rabies virus to other agents. On the contrary, the results of these peritoneal experiments conform to its sensitivity to proteolytic ferments. [*P. Remlinger and J. Bailly. Essai d'Interpretation de la Perte de Virulence des Moelles du Traitement Pasteurien. Bulletin de l'Académie Vétérinaire de France, xiii, March-April 1940, pp. 65-68.*]

The Symptoms of Brucellosis in Man

The onset of brucellosis in man is insidious and the course follows no particular pattern. An attack of indigestion and pain in the joints are two of the initial symptoms, but these are not generally suspected to be signs of the disease until the attacks are repeated. As the ailment advances, fever, pain, sweats and muscular depression become pronounced. The temperature waves gave birth to the name "undulant fever," but these waves are not constant or regular. They may disappear entirely and reappear after weeks or even months of apparent health. Certain cases, especially in children, may be afebrile. The painful spells vary in duration and intensity. They strike nerve trunks, articulations and areolar tissue. Weakness is a characteristic symptom and may exist in the absence of any of the other manifestations. The patient is tired, lazy and without energy, and falls into a state of mental depression and discouragement.

Orchitis occurs in perhaps 20 per cent of the cases, but genital localizations are not common in women. Although abortion is an outstanding manifestation in domestic animals, brucellosis in women is no more abortifacient than other septicemic infections. Bleeding gums, nose bleed and purpura and edema of the limbs are among the hemorrhagic conditions associated with brucellosis of the human being. Hepatitis, cholecystitis and biliary lithiasis are manifestations of undulant fever. Sometimes the localization is limited to the liver and its ducts. Constipation, anorexia, diarrhea,

anemia along with the hepatic disorder are of common occurrence.

The nervous system does not escape. The symptoms may resemble those of syphilis. Neurobrucellosis may be encephalic, medullary, meningeal or peripheral, in acute or chronic forms. The pulmonary, bronchial and laryngeal forms resemble tuberculosis.

In the skeleton, in addition to the joint foci, the spinal column is a place of predilection, especially the lumbar division. Spondylitis, osteoarthritis, osteoperiostitis, coxitis — resembling bone tuberculosis or gonorrhea—confound the clinical tableau. The pain may be violent.

On the jaw, in severe and generally fatal cases, there are the dry, black facial lesions, unilateral or bilateral. These lesions are said to be pathognomonic when they have developed in cases previously difficult to diagnose.

The mortality is 2 to 4 per cent; the duration six to eight months or even as long as three years. Experienced authorities have reported that recovery may never be complete.

Brucellosis of man is ruinous to the poor, owing to its protracted evolution and disabling nature. It is a fantastic malady without modality. It beggars description as much as it baffles the doctor. [*R. Michel-Béchet, with the collaboration of R. Puig and P. Charvet. Visceral Localizations and Surgical Aspect of Brucellosis (title translated). Masson & Co., Paris, 1939.*]

Stiff Lamb Disease (= Aphosphorosis)

Since pronounced similarity was observed in the appearance of the skeletal muscles in stiff lamb disease and the same entity in calves, affected lambs were treated with phosphoric acid. In stiff calf disease, blood samples from the dams (cows) showed inorganic phosphorus deficiency, and the calves exhibited stiffness, muscular weakness, paresis and emaciation, with death ensuing. *Post mortem* the skeletal muscles were pale, pinkish gray. When bone meal was fed to the cows and phosphoric acid to the calves, there were no further losses.

Stiff lamb disease was studied in a flock of 20 ewes, purchased in poor condition in the fall and wintered on hay and mangels with grain ration fed two weeks before lambing. The lambs were 3 weeks old when the flock was turned to pasture. In three or four days several of the lambs were stiff and in a week twelve were affected.

Given a dessertspoonful of dilute phosphoric acid twice a day for three days and then a teaspoonful twice a day for the remainder of the week, the lambs recovered in two weeks. One lamb badly stricken died of pneumonia after showing some improvement in locomotion.

Blood samples of the ewes showed that the phosphorus content ranged from 3.57 to 6.80 mg. per cent and of the lambs 5.88 to 9.0 mg. per cent. [*F. W. Schofield and A. F. Bain. Stiff Lamb Disease—An Aphosphorosis. Report of the Ontario Veterinary College (1939), p. 19.*]

Trichinosis in the Chicago Area

Diaphragms from 428 human necropsies at Chicago hospitals showed a *Trichinella spiralis* incidence of 16 per cent. This is in accord with findings reported from other localities in this country. Of the 428 samples investigated, 48 were obtained from infants under 1 year of age. Four (8.3 per cent) of these contained trichina larvae. This suggests prenatal infection.

Diaphragms from 500 hogs used for food in the Chicago area showed a trichinous incidence in only two animals (0.4 per cent). These hogs came from a restricted area and were presumably grain fed. (*M. Hood and S. W. Olson. Trichinosis in the Chicago Area. American Journal of Hygiene, section D, xxix, 1939, pp. 51-56.*)

BOOK NOTICES

A Curriculum in Veterinary Medicine

None is more competent to review the trend of veterinary education than the College of Veterinary Medicine of The Ohio State University, which came into being as an independent unit in 1885 to supersede the Department of Veterinary Medicine of

the College of Agriculture, established the preceding year (1884).

Credit for the founding of this college goes to Henrich Gannsen Detmers, native of Germany, who had a broad understanding of the need and opportunity of training men for the veterinary service of the great livestock country he chose for his labors. It was Detmers who planned the four-year curriculum and high school standards for admission which were to reign later in our educational system. He not only formulated the course of instruction in the usual medical branches, but also insisted upon including botany, histology, microscopy, hygiene, breeding and pharmacy as component branches of a proper veterinary training. But since this curriculum was ahead of his day, a three-year course was adopted and this was continued until 1915, when it was increased to four years. The four-year period continued for 18 years, or until 1933, when a fifth year was added to meet the demands of the broadening field of veterinary science.

The accession of Professor Brumley to the deanship in 1929 marks the beginning of a curricular expansion based upon data collected with painstaking effort from various sources (faculty, alumni, students and others) and upon a study of the veterinary needs of the Ohio region, and of the federal government. The survey brings out the salient fact that out of 740 alumni consulted, 42 per cent were engaged in private practice, 33.9 per cent in the public service, and the rest in miscellaneous pursuits.

In regard to the time practitioners devote to the different species of animals, it was found that cattle come first with 31 per cent; small animals, 24 per cent; swine, 18 per cent; horses, 10 per cent; poultry, 6 per cent; sheep, 3 per cent; other animals, 3 per cent; and public health, 2 per cent. The percentage of their income derived from these species was about the same as these figures.

Although the figures may seem to have been set down from reports of relatively few (740), the number comprises a sufficient proportion of the veterinarians of Ohio and adjacent territory to be of outstanding value, not only to a veterinary college bent upon serving its constituents intelligently, but also to the veterinary service of the whole country, because just what veterinarians do and just how many are needed are fundamental but unsolved questions.

In short, this booklet teems with information. To the office of the AVMA, which is now engaged in making a nationwide canvas of the veterinary profession, it is a timely aid. [*A Curriculum in Veterinary Medicine. Research Monographs, No. 23. By Oscar V. Brumley, Dean, College of Veterinary Medicine, The Ohio State University and E. W. Charters, Director, Bureau of Educational Research, The Ohio State University. Edited by Josephine H. Macclatchy. Paper. Pp. 78. Price $1.75. The Ohio State University, 1940.*]

Diseases of Pigs

To know pigs one must first realize that this domestic animal of remote antiquity ranks high as a maker of food. One hundred lb. of feed will produce 20 lb. of deadweight pig flesh. In live weight 1 lb. represents but 3½ lb. of feed. So, as a food producer the pig gives the most for the money. There is but little waste. The nonedible offal goes to fats, animal feeds and fertilizer, a reminder of the popular paradox that "Nothing is lost but the squeal." American readers of *Diseases of the Pig* will agree that this is the reason pigs are the bulwark of our farming industry.

The chapter on breeds—Chapter 1—describes 14 English breeds, 11 American breeds and 12 breeds of Continental Europe and Asia, some of which are not generally included in the sum of our knowledge of hogs. The illustrations of the main breeds are excellent reproductions of the qualifying characteristics of each.

While the chapter on housing and management is, of course, written for the pig raiser of the British Isles, it contains information which might be used to good advantage even by the large-scale breeders of our Corn Belt, where mass production

sometimes overwhelms capacity to an extent that leads headlong into the great veterinary problems which, in turn, sometimes overwhelm the ability to handle them. The fattening houses, farrowing houses, the movable runs and other features of management show that pig raising in England is a fine art, and as for advice on feeding, little is omitted down to the last known fact about the necessary minerals and the various vitamins and their fractions. How pigs are fed for gains and quality of their meat where maize (corn) is not the basal ingredient is fascinating reading.

The scheduled (reportable) diseases of pigs in England are anthrax, foot and mouth disease, paratyphoid, cholera and rabies. Modern methods of handling them in obedience to the laws are described. Considerable importance is placed upon laboratory tests for cholera, such as the urine-rabbit test of the Russians and the blood-castor-oil test of Sarnowiec. In fact, the able manner in which the author deals with the subject of cholera is a good pattern of the book as a whole, although the attempt at macroscopic differentiation from structural alterations is no more or no less confusing than usual. It is interesting to note that erysipelas is not a "scheduled disease," notwithstanding that it is admitted to be serious, quite common and contagious, and that it spreads readily and is transmitted to man. The description of erysipelas is accompanied by pictures of the characteristic valvular and cutaneous lesions.

The chapters on constitutional diseases, local diseases and parasites cover the ground without notable omission and bring our knowledge of them up to date. The deficiency diseases including the avitaminoses in pigs and adult swine is a short but quite complete chapter showing the author's keen insight to the details of this broad subject in swine breeding.

Diseases of the Pig is a well-told, up-to-date story of a branch of veterinary science that the swine practitioner will appreciate for its modernism, probity and factual concepts. [*Diseases of the Pig and Its Husbandry. By David J. Anthony, M.R.C.V.S., D.V.S.M. Cloth. Pp. 272. Well illustrated. Price, $3.50. The Williams & Wilkins Company, Baltimore, 1940.*]

Anatomy of Domestic Animals—Atlas and Dissection Guide

Obviously spurred by predecessors who placed studies of the basal sciences of the curriculum upon a high level, the chair of veterinary anatomy at Iowa State College continues to enrich the literature on its branch of veterinary medicine.

This manual contains 64 large pages of real anatomy portrayed by color plates, sketches and the necessary legends. The pictures are graphic and the legends are in the terminology of the *Nomina Anatomica Veterinaria* compiled by the Committee on Anatomical Nomenclature of the AVMA under the chairmanship of the late Septimus Sisson of the College of Veterinary Medicine, The Ohio State University.

The illustrations reveal a great deal of painstaking work and accurate knowledge of the subject. They catch the eye. Color is used to show the sources and organic terminations of the arterial trunks. The sketches of the aorta showing its origin and variating terminals in the horse, dog, ox and pig are masterpieces of refreshing information on this important part of quadrupedal anatomy.

In short, the author gives the reader a course in gross anatomy of domestic animals in a few pages. The baffled freshman launched into a new sea, the absent-minded senior cramming for his finals and the doctors worried over coming state board examinations will find this booklet apropos. [*Anatomy of Domestic Animals—Atlas and Dissection Guide. By H. L. Foust, D.V.M., head of the Department of Anatomy, Division of Veterinary Medicine, Iowa State College. Paper. 64 pages. Illustrated. Price $1.75. The Iowa State College Press, Ames, Iowa, 1940.*]

Medicine knows a lot about things no one has ever seen, just like the engineer who describes the bottom of an oil well but never saw one.

THE NEWS

AVMA Activities

Edwin Laitinen Represents District 9 on Executive Board

As announced briefly on page 634 of the December 1940 issue, Edwin Laitinen of West Hartford, Conn., has been named by President Wight to represent District 9 (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont) on the Executive Board to fill out the unexpired term (1942) of H. W. Jakeman, who became an *ex-officio* member of the Board by having been elected president-elect of the Association.

Edwin Laitinen

Dr. Laitinen was born in Brooklyn, N. Y., September 1, 1895, and was graduated from the University of Toronto in 1916. For about one year following graduation he served in the city food-inspection service of Texarkana, Texas-Ark. In 1918, he was engaged for a few months in contagious disease-control work at Boston, Mass. That same year World War duty called him to Camp Devens, where he entered the remount service. Since October of 1919, he has been engaged in private practice in West Hartford.

An ardent supporter of organized veterinary medicine, Dr. Laitinen is a member of the AVMA, AAHA, New England Veterinary Medical Association, Connecticut Veterinary Medical Association, Massachusetts Veterinary Medical Association and Veterinary Medical Association of New York City.

Dr. Laitinen's appointment to the Board brings the practitioner membership of that body to four, the others being Bower, Wilson and Seagraves.

Reprint Price Schedule Revised

Relative to a decision of the Executive Board at the Washington session, the reprint schedule for the Association's periodical publications has been revised so as to provide reduced charges to members who wish to secure reprints articles. The new schedule will be furnish on request.

Explanation Concerning Dues Remittances

Letters and remittances received in recent weeks indicate misunderstanding, in some instances, of exactly what is provided for members by payment of their annual dues. These misunderstandings have arisen, presumably, as a result of two incidents: first, the mailing of a notice under date of September 11, 1940, which solicited early payment of dues and also subscriptions to the new quarterly publication, the American Journal of Veterinary Research; second, the mailing, under date of December 5, 1940, to members who had not responded, of a dues notice different in form and wording from that used in previous years.

With a view to clarifying the situation, attention of all members is respectfully directed to the following:

1) The annual dues of $5.00, as prescribed in the by-laws, covers dues and subscription to the regular journal for the calendar year.

2) The wording on the dues notice mailed December 5, 1940, indicated that $2.50 of the $5.00 annual dues is for subscription to the official organ. This wording was used in conformity with postal regulations. However, a remittance of only $2.50 can not be accepted in payment of either dues alone or subscription alone, as some members have inferred.

3) The new publication, American Journal of Veterinary Research, can be substituted for the regular journal only when two members, by virtue of being in the same family or in a partnership, are receiving duplicate journals.

Re: AVMA Office Signs

The supply of office signs, offered to members in recent years and listed on the 1941 dues notice at 50 cents each, is exhausted and the present sign will not be restocked because a new one is being designed.

Pending procurement of a new supply the Association begs the indulgence of members whose orders can not be filled immediately. Orders now on file will be cared for just as soon as possible.

Wight and Jakeman Address State Meetings

President Wight spoke on behalf of the national association at the 44th annual meeting of the Minnesota State Veterinary Medical Society, held at the Hotel Lowry in St. Paul, January 6-7. He also addressed the Kansas Veterinary Medical Association at their 37th annual convention in Manhattan, January 8-9. In the afternoon of January 8, he was honored by a special session of the Kansas State College student chapter during which he was presented with an envelope containing an application for membership in the AVMA for each of the 60 senior veterinary students at the College. On January 28-30, Dr. Wight represented the Association at the Iowa state meeting in Des Moines.

President-Elect Jakeman was a guest speaker at the banquet of the Rhode Island Veterinary Medical Association, which convened in Providence, January 14.

Executive Secretary Hardenbergh conferred with the Committee on Local Arrangements for the Association's 78th annual meeting at a special session called in Indianapolis, January 13. He was in attendance at the Indiana state meeting in Indianapolis, January 14-16, the Illinois state meeting in Springfield, January 23-24, and the Iowa State meeting in Des Moines, January 28-30.

Dog-Food-Testing Statement Presented at Nine Meetings

A statement on the dog-food-testing program of the American Animal Hospital Association and the American Veterinary Medical Association was presented, in recent weeks, before nine state meetings by prominent members of the various state associations.

Presentation of the statement has been a part of the publicity program of the two associations to acquaint veterinarians, breeders and dog owners with the merits of tested and approved dog foods. This publicity work will be continued at state conventions throughout 1941.

The speakers and the meetings which they addressed were:

O. F. Reihart, Omaha, Neb. Nebraska State Veterinary Medical Association, December 1 in Grand Island.

G. E. Melody, Gettysburg, S. Dak. South Dakota Veterinary Medical Association, December 13 in Sioux Falls.

H. H. Dukes, Cornell University. Cornell University Annual Conference for Veterinarians, Ithaca, N. Y., January 8.

Russell E. Rebrassier, Columbus, Ohio. Ohio State Veterinary Medical Association, January 8 in Columbus.

J. A. Bogue, Wichita, Kan. Kansas Veterinary Medical Association, January 9 in Manhattan.

F. Y. S. Moore, McAlester, Okla. Oklahoma Veterinary Medical Association, January 13 in Oklahoma City.

Charles C. Dobson, New Augusta, Ind. Indiana Veterinary Medical Association, January 14 in Indianapolis.

William R. Ecker, Newark, N. J. Veterinary Medical Association of New Jersey, January 15 in Trenton.

Guy P. Hatchett, Chattanooga, Tenn. Tennessee Veterinary Medical Association, January 20 in Nashville.

Following is the statement presented by Dr. Bogue in Manhattan, Kansas. Similar statements were read before the other state meetings.

"I have been asked to read a statement which should be of interest to every veterinarian in Kansas because of its importance to our state. It concerns a major program of our national association and of the American Animal Hospital Association. This program is the testing of dog foods and the awarding of a seal of approval to those tested foods which will nourish the average dog properly.

"This program is of special importance to Kansas because of the agricultural character of our state. Kansas' chief economic wealth is in her cattle and in her crops. Anything that helps our farmers to sell more meat, or more corn, wheat or oats, is of direct benefit to the entire state. It will help all our people, veterinarians included.

"The dog-food-testing program is a measure which will help to sell more of the products of Kansas' farms. Let me explain why.

"As you all know, dogs are more popular as pets today than ever before. Well-informed experts declare there are between 15 and 20 million dogs in the country, and this total is increasing steadily. The popularity of these pets has been noted particularly in large cities where the canine population equals, or even exceeds, the number in rural areas.

"The dog-food-testing program is of special importance to our state because Kansas boasts

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Each year the Association spends a considerable sum in locating "lost" members and in remailing the JOURNAL *to those who inform us of changes of address at a date too late to correct our records for the current month's mailing.*

Members who change locations should, whenever possible, notify the central office before the 20th of the month in order to allow sufficient time for changing our records.

one of the largest dog populations of any state in the country. Proper feeding of these animals becomes a humanitarian matter when it is remembered that dogs may suffer quite as much from inadequate feeding as they can from brutal treatment. It would follow, therefore, that every true lover of dogs should pay as much attention to the quality of food fed to his pet as he does to the quality of food he himself consumes. And it is the veterinarian's duty to urge this humane treatment.

"Because of the opportunity to supply food for millions of dogs which are housed in city homes and apartments, a gigantic prepared-dog-food industry has grown up in this country during the past 10 or 15 years. Today more than 250 manufacturers of these prepared diets do a business totaling millions of dollars a year.

"The history of this industry has been no different from the history of many other industries. The field has been entered by many manufacturers who are scrupulously honest and ethical in their preparation of dog foods. Unfortunately, however, there are other manufacturers who are far less scrupulous. In fact, some of the preparations on the market have been found to be nutritively worthless.

"You all know that dog foods need cereals or meat to have any value in nourishing animals. And yet some of the foods on the market contain no more than a couple of spoonfuls of cereal and a small amount of "beef scraps," which are defined as any part of the animal between the horns and the hoofs. Often the "meat" portion of the foods are windpipes, intestinal walls, etc. They may also contain packing house waste and water, stuck together with a bit of coarse, colored gelatin to give the appearance of solid food.

"The volume of such foods on the market, of course, is unknown. However, there is evidence to believe that the volume is considerable.

"It is readily apparent that such foods can not nourish a dog if he gets no other food. It is obvious, also, that Kansas livestock producers and farmers are selling very little of their products to the manufacturers of such dog foods. And this is where the dog-food-testing program can help our state industries.

"The program seeks to put the weight of a united veterinary profession behind those scrupulous, honest manufacturers who are making a worthwhile nutritious food. At the same time, it seeks to reduce the volume of worthless preparations on the market. The method of accomplishing this is to identify dog foods with an assured nutritional value by a Seal of Approval. Thus, for the first time dog owners have a method whereby they can choose those foods which will benefit their pets.

"That the program is succeeding is shown by the definite increase in interest in it among manufacturers, veterinarians, and dog owners. M. L. Morris of New Brunswick, N. J., who is chairman of the Committee on Foods of the American Animal Hospital Association, reported recently that the sale of dog foods bearing the seal of approval of the AAHA and the AVMA is expanding rapidly throughout the United States.

"All of the present holders of the seal have voted to continue their coöperation. Dr. Morris also reported that another manufacturer is submitting his food for test and that several other applications are pending. All indications are that the testing and approval of dog foods will go forward at a more rapid pace during 1941.

"The dog-food-testing program has been studied carefully by the Executive Board of the American Veterinary Medical Association as well as by the House of Representatives. Both bodies have approved the program and have recommended continued coöperation with the American Animal Hospital Association in conducting it.

"In this connection, I would like to call your attention to the report of the Special Committee of the Executive Board on Dog-Food Testing which was published in the October 1940 issue of the JOURNAL. O. V. Brumley, dean of the College of Veterinary Medicine of The Ohio State University and a past president of the AVMA, was chairman of the special committee.

"At present there are many adequate preparations for sale which do not carry the seal of approval only because the manufacturers have not requested that they be tested. There are also many worthless foods available. A dog owner is unable to tell the good from the bad except by trial and error—an expensive and dangerous method. The Seal of Approval, however, is pointing the way out of this difficulty.

"All veterinarians want to see the difficulties of dog ownership overcome. This will mean more dogs and greater profits to them. It is in your interest, therefore, to back this program enthusiastically.

"You can back it also with the knowledge that the program will stimulate the sale of cereals and of meat to honest manufacturers and thereby help your clients—the Kansas livestock producers and farmers. When all dog foods contain quality meat and cereals, instead of sweepings, the farmers of our state will have a larger market. What benefits the farmers will benefit you.

"The program merits your enthusiastic support. You can help most by recommending seal of approval diets to your clients."

Copies of "For Your Pet's Health," a publication sponsored by the coöperating associations which deals with a number of important angles in the testing program, were distributed at the meetings.

Wilson & Company's Veterinary Service

More and more as time goes on, the industries allied to or directly concerned in animal production outwardly express their faith in veterinary science by adding prominent veterinarians to their executive or advisory staffs. Notable in this connection was the recent employment of R. F. Vermilya, M.D.C., and H. E. Kingman, Jr., D.V.M., to the inner councils of Wilson & Company, Chicago meat packers and provisioners.

R. F. Vermilya

These well-known figures of the veterinary profession, along with A. A. Swain, D.V.M., who has served this packing firm capably for many years, are assigned to commanding positions in fields which the American meat packers have kept uppermost in mind through the years, namely, the production of healthy live stock in ample numbers plus the scientific and practical inspection of their products. In this turbulent period of world history with wholesome and sufficient food supply preëminent among the problems of national defense, this evidence of faith in the proper application of veterinary science is as gratifying to the veterinary profession as it is helpful to the American people, not only in lending aid and encouragement to the producers of live stock, but also in keeping a watchful guard over the welfare of the consumers of meat and the many delectable products of the meat-packing industry.

R. F. Vermilya (Chi. '06) served all of his professional life in the government service until joining the Wilson staff last December on taking voluntary retirement from the U. S. Bureau of Animal Industry while serving as inspector-in-charge at Boston. His career began with the federal meat inspection service in South St. Paul, Minn. During the World War he did meat-inspection work in army camps and was honorably discharged as a veterinary officer in 1919. His later experiences comprised field work in California during the 1924 outbreak of foot and mouth disease and later duties as inspector-in-charge at Wheeling, W. Va., Detroit and Boston.

In association work Dr. Vermilya has taken an active part in the American Veterinary Medical Association; National Association of Bureau of Animal Industry Veterinarians, of which he served as president; Organization of Professional Employees of the USDA; Eastern States Live Stock Loss Prevention Association; Federal Business Association of Boston; Department of Agriculture Club, of which he was recently elected an honorary member; and the Massachusetts Veterinary Association. During his tenure at Detroit he was chosen president of the Southwestern Michigan Veterinary Medical Association.

In his present position, Dr. Vermilya has the honor of assuming many of the duties so capably handled for Wilson & Company by the late R. F. Eagle, and the task of working closely with the research and operating departments maintained for advancing the science and art of meat inspection. A fine tribute to the knowledge, experience and decorum he brings to his new connection was the testimonial given to him before he left Boston for Chicago. Seated at this dinner were over 200 officials and employés of the local packing companies, and professional colleagues.

H. E. Kingman, Jr.

H. E. Kingman, Jr., (Colo. '33) was born at Fort Collins, Colo., September 4, 1911. Following graduation he engaged in private practice in California and later entered the U. S. Bureau of Animal Industry to assist that state in completing bovine tuberculosis eradication. In 1936, he was given a leave of six months to study special phases of reproduction and artificial insemination and at the end of that time was assigned to the calfhood vaccination experimental work the Bureau was doing. In 1939, he was transferred to the Pathological Division of the Bureau with station at Chicago, where he remained until September 1940, resigning at that time to join the Wilson staff.

Dr. Kingman is a member of the American Veterinary Medical Association, United States Live Stock Sanitary Association, and Conference of Research Workers in Animal Diseases of North America.

APPLICATIONS

First Listing*

ARCHER, ODELL
Clinton, Ind.
D.V.M., Indiana Veterinary College, 1917.
Vouchers: H. Marvin Bratt and W. C. Sprinkle.

BIGERT, EDWARD J. J.
51 Union St., Walton, N. Y.
D.V.M., Cornell University, 1934.
Vouchers: Wm. Hagan and E. Sunderville.

BOYER, W. PHILIP
1 Glenbrook Rd., Morris Plains, N. J.
V.M.D., University of Pennsylvania, 1932.
Vouchers: L. R. Barto and Ellis P. Leonard.

BRYAN, H. E.
Angola, Ind.
D.V.M., Indiana Veterinary College, 1914.
Vouchers: J. C. Schoenlaub and D. M. Campbell.

CHURCH, DWIGHT S.
1527 N. Washington Ave., Scranton, Pa.
V.S., Ontario Veterinary College, 1895.
Vouchers: Ernest W. Hogg and L. A. Merillat.

CLARK, HAROLD C.
3 Sharon St., Geneva, N. Y.
D.V.M., Cornell University, 1930.
Vouchers: Wm. Hagan and E. Sunderville.

CLARK, MAURICE E.
Boston, Ind.
D.V.M., Michigan State College, 1938.
Vouchers: J. C. Schoenlaub and J. L. Kixmiller.

CONGER, WILMER I.
2420 N. 43rd St., Kansas City, Kan.
D.V.M., Kansas State College, 1933.
Vouchers: Graham R. Davidson and Glenn I. Case.

DAVIDSON, L. R.
2426 Grand Ave. W., Detroit, Mich.
B.V.Sc., Ontario Veterinary College, 1939.
Vouchers: Don T. Kemp and W. G. Davidson.

DAVIDSON, W. B.
P. O. Box 1177, Swift Current, Saskatchewan.
B.V.Sc., Ontario Veterinary College, 1918.
Vouchers: Norman Wright and J. G. Hardenbergh.

EVANS, WILLIAM M.
110 Delaware Ave., Ithaca, N. Y.
D.V.M., Cornell University, 1932.
Vouchers: Wm. Hagan and R. R. Birch.

FORSYTHE, R. H.
389—5th Ave. N., South St. Paul, Minn.
D.V.M., Chicago Veterinary College, 1913.
Vouchers: John N. Campbell and G. S. Failing.

FRIEDLEY, STANLEY M.
Decatur, Ind.
D.V.M., Indiana Veterinary College, 1917.
Vouchers: Edgar D. Wright and J. L. Kixmiller.

FRIEDLINE, LLOYD M.
Jonesboro, Ind.
D.V.M., Indiana Veterinary College, 1917.
Vouchers: Edgar D. Wright and J. C. Schoenlaub.

GRUNER, W. H.
412 W. Franklin St., Evansville, Ind.
D.V.M., Indiana Veterinary College, 1912.
Vouchers: J. L. Kixmiller and Chas. W. Fisher.

HAFLICH, CURTIS E.
Markle, Ind.
D.V.M., Indiana Veterinary College, 1912.
Vouchers: Edgar D. Wright and Geo. L. Clark.

HAUGE, RONALD
924 Del Paso Blvd., North Sacramento, Calif.
D.V.M., State College of Washington, 1939.
Vouchers: W. L. Curtis and J. G. Hardenbergh.

HIATT, CHAS. B.
Kewanna, Ind.
D.V.M., Indiana Veterinary College, 1911.
Vouchers: Chas. W. Fisher and Edgar D. Wright.

HINER, O. W.
Butler, Ind.
V.M.D., Indiana Veterinary College, 1906.
Vouchers: J. C. Schoenlaub and D. M. Campbell.

KING, ROE
Sheridan, Ind.
D.V.M., Indiana Veterinary College, 1916.
Vouchers: J. C. Schoenlaub and Glenn L. Ebright.

MCDONALD, IAN C.
P. O. Box 594, Newman, Calif.
D.V.M., Kansas State College, 1938.
Vouchers: Edwin J. Frick and W. R. O'Neal.

MERRYMAN, WALTER R.
644—4th Ave. S., South St. Paul, Minn.
B.V.Sc., Ontario Veterinary College, 1932.
Vouchers: C. O. Eliason and Edward Wanner.

NOTTINGHAM, M. O.
101 Broadway, Summitville, Ind.
D.V.M., University of Georgia, 1932.
Vouchers: Edgar D. Wright and Frank H. Brown.

NUTTER, BYRON J.
R. R. No. 1, New Augusta, Ind.
D.V.M., Indiana Veterinary College, 1918.
Vouchers: C. H. Herrold and W. A. Sullivan.

*See January 1941 issue, p. 87.

PHILLIPS, C. E.
55A MacKay Ave., W. Toronto, Ontario.
B.V.Sc., Ontario Veterinary College, 1940.
Vouchers: Seymour Hadwen and G. A. Rose.

PURSLEY, FRED
Modoc, Ind.
D.V.M., Indiana Veterinary College, 1916.
Vouchers: J. C. Schoenlaub and H. Meade Hamilton.

RETAMALES, N., R.
Avenida Malta 391, Santiago, Chile
D.V.M., University of Chile, 1938.
Vouchers: J. San Miguel and Balbino Sanz.

ROBERTS, JAMES F.
Swayzee, Ind.
D.V.M., Indiana Veterinary College, 1918.
Vouchers: J. L. Kixmiller and J. L. Axby.

SEIBERT, NORMAN E.
R. D., Hummelstown, Pa.
D.V.M., Cornell University, 1938.
Vouchers: Jas. F. Shigley and J. G. Hardenbergh.

TIMMS, JOHN M.
218 Grove St., Hudson, Mich.
D.V.M., Grand Rapids Veterinary College, 1906.
Vouchers: C. F. Clark and B. J. Killham.

VAIL, EDWARD L.
203 Administration Bldg., Union Stock Yards, Los Angeles, Calif.
V.M.D., University of Pennsylvania, 1936.
Vouchers: L. M. Hurt and W. L. Curtis.

WELBOURN, W. E.
Winchester, Ind.
D.V.M., Ohio State University, 1938.
Vouchers: J. L. Kixmiller and J. L. Axby.

WHITE, HERBERT G.
903 S. Jackson St., Frankfort, Ind.
V.M.D., Indiana Veterinary College, 1908.
Vouchers: Edgar D. Wright and F. C. Tucker.

Second Listing

Albright, Alanson, Cayuga, Ind.
Allen, Bertram V., 1220 Maumee Ave., Fort Wayne, Ind.
Andrews, J. R., 510 E. Main St., Ottawa, Ohio.
Bergman, R. H., Madison, Minn.
Blakely, Franklin C., 7 Central Place, Newburyport, Mass.
Brennan, James A., 425 S. Main St., Gloversville, N. Y.
Burriss, Theo. L., Anderson, S. Car.
Burstein, Harold, 4148 Pennsgrove St., Philadelphia, Pa.
Carpenter, M. Y., 621 Wells Parkway, Norfolk, Va.
Carroll, Floyd E., 508 S. 2nd St., Laramie, Wyo.
Cole, Harry L., R. F. D. 7, Bay and Schust Rds., Saginaw, Mich.
Cone, M. J., 88 E. Housatonic St., Pittsfield, Mass.
Cram, Herbert C., 558 N. W. 43rd St., Miami, Fla.
Curry, Joseph M., 39 Hartland St., Hartford, Conn.
Dean, R. F., North Salem, Ind.
De Mott, Andre R., Utica St., De Ruyter, N. Y.
Dershem, George E., Roann, Ind.
Downing, Ralph R., 311 Range Lane, E. St. Louis, Ill.
Draper, Andrew M., 1856 Post Rd., Fairfield, Conn.
Everson, Clyde L., Live Stock Sanitary Service, College Park, Md.
Finney, G. E., Onancock, Va.
Funchess, L. C., 128 N. Mason St., Bowie, Texas.
Graves, Colby, P. O. Box 26, Culpeper, Va.
Hinkle, Earl S., 124 W. Main St., Centerville, Ind.
Hoskins, R. J., 3203 E. Washington St., Indianapolis, Ind.
Jones, T. Lloyd, Veterinary Laboratory, Dept. of Agriculture, Edmonton, Alberta.
Kelly, Crosby, 2924 Mills Ave. N. E., Washington, D. C.
Kendall, Hunter E., Route 1, Milstead, Ala.
Leonard, T. W., Newellton, La.
Lloyd, Samuel E., 802 Genesee St., Buffalo, N. Y.
Lockridge, F. R., 1010 W. Market St., Crawfordsville, Ind.
Lynett, J. F., 141 Jefferson Ave., Scranton, Pa.
Mickelsen, C. H., 1447 El Miradero St., Glendale, Calif.
Mims, Lee Roy, P. O. Box 183, Auburn, Ala.
Olbeter, Rudolph M., Clayton, N. Mex.
Rea, H. Calvin, P. O. Box 5264, Charlotte, N. Car.
Reedy, J. E., Paso Robles, Calif.
Rose, C. E., North Liberty, Ind.
Schwartz, J. A., Danville, Ind.
Scott, Paul Franklin, New Market, Ind.
Sherman, Leonard H., 50 N. Clinton Ave., Bay Shore, L. I., N. Y.
Shikles, Ernest A., Dearborn, Mo.
Swales, W. E., Macdonald College P. O., Quebec.
Torres, Sylvio, Rua Ibituruna 12 Casa F, Rio de Janeiro, Brazil.
Winslow, Joseph H., Box 52, La Moure, N. Dak.
Wishard, Dell E., P. O. Box 692, Edinburg, Texas.

Diamond Anniversary Year for Parke, Davis & Company

The year 1941 marks the Diamond Anniversary of the founding of Parke, Davis & Company, a firm which had its inception in a small drug store in Detroit, Mich., and which, during the past 75 years, has become the world's largest maker of pharmaceutical and biological products.

Eminent in both the medical and veterinary circles, the Parke-Davis institution is widely

known for its research contributions and progress in clinical investigation. In 1894, the firm established the first commercial biological laboratory in the United States.

Tioga Mills Announces Five New Products

Tioga Mills, Inc., of Waverly, N. Y., manufacturers of animal feeds for over 30 years, has augmented its "dog-food family" by five new products which were placed on the market last month. The new products are biscuits, medium kibbles, fine kibbles, canned dog food and canned beef ration.

Ostertag Dies in Germany

Prof. Dr. Robert Von Ostertag of Stuttgart, Germany, distinguished veterinarian and an honorary member of the Association, died a short time ago in Germany at the age of 76. [*News of Ostertag's death was received from John R. Mohler just at press time. A detailed report will appear in the next issue.*]

U. S. GOVERNMENT

Regular Army

Lt. Colonel James E. Noonan is relieved from assignment and duty at Fort Belvoir, Va., and is assigned to duty at Headquarters, Sixth Corps Area, Chicago, Ill., effective December 10, 1940.

Colonel Jean R. Underwood is relieved from his assignment and duties at Headquarters, Eighth Corps Area, Fort Sam Houston, Texas, effective in time to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about January 24, 1941, for the Philippine department, for duty.

Lt. Colonel Josiah W. Worthington is relieved from duty at Fort George G. Meade, Md., effective in time to proceed to New York, N. Y., and sail on transport scheduled to leave that port on or about January 4, 1941, for the Philippine department, for duty.

Each of the following named officers of the Veterinary Corps is assigned to duty at the station indicated after his name, effective upon completion of his present tour of foreign service in the Philippine department: Lt. Colonel Clifford E. Pickering, Fort Benning, Ga.; Major Verne C. Hill, S. C. Remount Area Headquarters, San Angelo, Texas; Captain Curtis W. Betzold, Fort Bliss, Texas.

Captain Stephen G. Asbill is relieved from duty at Fort Bliss, Texas, and assigned to duty at the 4th Medical Supply Depot, Fort Sam Houston, Texas.

Lt. Colonel Daniel H. Mallan is relieved from assignment and duty at Langley Field, Va., effective on or about February 15, 1941, assigned to duty at the Medical Department Replacement Center, Camp Lee, Va., and to additional duty as post veterinarian, Camp Lee, Va.

Lt. Colonel Oness H. Dixon, Jr., is relieved from assignment and duty at Fort Monroe, Va., and from additional duty as attending veterinarian, Nansemond Ordinance Depot, effective on or about February 15, 1941, assigned to duty at the Medical Department Replacement Center, Camp Grant, Ill., and to additional duty as post veterinarian, Camp Grant, Ill.

Lt. Colonel Frank M. Lee is relieved of duty at Jefferson Barracks, Mo., and from additional duty in the office of the Quartermaster, St. Louis, Mo., effective on or about December 28, 1940, and is assigned to duty at the Kansas City Quartermaster Depot, Kansas City, Mo.

Each of the following named officers is relieved from assignment and duty at the San Antonio General Depot, Fort Sam Houston, Texas, is assigned to duty at the San Antonio General Depot Branch, Fort Worth, Texas, and will proceed to that station and report for duty: Major John R. Ludwigs, United States Army retired; First Lieutenant Elmer A. Maier, Veterinary Corps Reserve.

Major Harry R. Leighton is relieved from duty at Fort Williams, Maine, effective in time to enable him to proceed to New York, N. Y., and sail from that port on or about April 2, 1941, for the Philippine department, for duty.

Captain John K. Allen is relieved from assignment and duty at Fort Myer, Va., and is assigned to the Third Cavalry, at that station, and will report for duty.

Veterinary Corps Reserve

First Lieutenant William S. Gochenour, Jr., Veterinary Corps Reserve, is relieved from duty at Selfridge Field, Mich., and assigned to duty in the Philippine department, sailing from New York, N. Y., on or about January 4, 1941.

First Lieutenant Benjamin D. Blood, Veterinary Corps Reserve, is relieved from assignment and duty at the North Central Remount Area, Kansas City, Mo., effective January 6, 1941, assigned to duty at the Savannah Air Base, Savannah, Ga., and directed to proceed to the Chicago Quartermaster Depot, Chicago, Ill., on temporary duty for a period of 30 days for the purpose of pursuing a course of instruction in the inspection of meat, meat-food, and dairy products, and upon completion of this temporary duty to proceed to Savannah, Ga., and report for duty.

First Lieutenant Henry J. Lindenstruth is relieved from duty at Fort Snelling, Minn., is assigned to duty at the San Francisco Port of Embarkation, Fort Mason, Calif., and will proceed by rail to that station and report to the

commanding general for duty with the Veterinary Corps.

Announcement is made of the promotion of the following named officers of the Veterinary Corps Reserve, now on active duty, on date indicated opposite their names: Captain Merrill L. Steele, December 30, 1940; First Lieutenant Rolland O. Scott, December 28, 1940.

The following veterinary reserve officers have been ordered to extended active duty by the War Department during the month of December and assigned to stations indicated: Captain Duane L. Cady, Fort Snelling, Minn.; First Lieutenant Ervin A. Eichhorn, Army Medical Center, Washington, D. C.; First Lieutenant Charles R. Wainwright, Brooks Field, Texas; First Lieutenant Wm. F. Hoffman, Camp Lee, Va.; First Lieutenant Everett B. Miller, Fort Belvoir, Va.

The following officers of the Veterinary Corps Reserve (first lieutenants unless otherwise indicated), now on extended active duty at the stations indicated, are directed to proceed to Chicago, Ill., and report to the commanding officer, Chicago Quartermaster Depot, for temporary duty for a period of 30 days for the purpose of pursuing a course of instruction, commencing on January 6, 1941, in the inspection of meat, meat-food and dairy products, under the depot veterinarian. Upon completion of this duty each of the officers indicated will return to his proper station:

Benjamin D. Blood, Savannah Air Base, Savannah, Ga.

Wm. F. Hoffman, Camp Lee, Va.

Everett B. Miller, Fort Belvoir, Va.

Ernest Wm. Rivers, Camp Edwards, Mass.

Samuel J. Levine, Fort Banks, Mass.

Capt. Leo L. Lieberman, Fort H. G. Wright, N. Y.

Ralph C. Fish, Jr., Camp Upton, N. Y.

Thomas Lawrence, Fort Jay, N. Y.

Wm. C. Todd, Jr., Madison Barracks, N. Y.

Wm. J. Sherwood, Camp Shelby, Miss.

Clyde R. Moses, Camp Beauregard, La.

Capt. Charles P. Hesse, Fort Knox, Ky.

Sol G. Stephan, Fort Knox, Ky.

Harry G. Geyer, Headquarters, 5th Corps Area, Columbus, Ohio.

Grant F. Cottrell, Fort Snelling, Minn.

Alton M. Coddington, Fort Des Moines, Iowa.

Frank H. Olvey, Fort Huachuca, Ariz.

Wm. E. Draus, Fort Clark, Texas.

Hilding M. Marlowe, Presidio of Monterey, Calif.

Edward H. Von Glan, Fort Lewis, Wash.

Major Robert S. MacKellar, Jr., 102nd Medical Regiment, Fort McClellan, Ala.

BAI Transfers

Laurence B. Adams from Atlanta, Ga., to Richmond, Va., on meat inspection.

Gayle D. Allen from Little Rock, Ark., to Albuquerque, N. Mex., on Bang's disease.

Joseph Belinsky from Harrisburg, Pa., to Charleston, W. Va., on Bang's disease.

George S. Carter from Dubuque, Iowa, to Edgar, Wis., in charge of meat inspection.

Joseph H. Digranes from Oklahoma City, Okla., to Dubuque, Iowa, on meat inspection.

Samuel Edelstein from Atlanta, Ga., to New York, N. Y., on meat inspection.

Carl H. Fauks from Pierre, S. Dak., to Oklahoma City, Okla., in charge of tuberculosis eradication.

Harris H. Groten from Harrisburg, Pa., to Richmond, Va., on Bang's disease.

Frank A. Henney from Denver, Colo., to Lincoln, Neb., on tuberculosis eradication.

Ormond J. Hummon from Columbus, Ohio, to Beltsville, Md. (Zoölogical Division).

John M. Klar from Harrisburg, Pa., to Richmond, Va., on Bang's disease.

Leonard Krawitz from Albany, N. Y., to Raleigh, N. Car., on tuberculosis eradication.

Claude F. Murphy from Lincoln, Neb., to Omaha, Neb., on meat inspection.

U. Stanley McConnell from Olympia, Wash., to Los Angeles, Calif., on meat inspection.

Neil Plank from Lincoln, Neb., to Pierre, S. Dak., in charge of tuberculosis eradication.

Vincent J. Schweiger from Topeka, Kan., to Albuquerque, N. Mex., on Bang's disease.

Herbert Shear from Chicago, Ill., to Springfield, Mass., on meat inspection.

Frank C. Swaney from Lincoln, Neb., to Milwaukee, Wis.

Carl C. Taylor from Wheeling, W. Va., to Pittsburgh, Pa., on meat inspection.

Arthur L. Tellejohn from Columbus, Ohio, to Pearl River, N. Y., on virus-serum control.

Morgan W. Tempero from Oklahoma City, Okla., to Albuquerque, N. Mex., on Bang's disease.

Calvin A. Trapkey from Cincinnati, Ohio, to Cleveland, Ohio, on meat inspection.

Earl M. Walker from Pierre, S. Dak., to Denver, Colo., on Bang's disease.

Byron M. White from Harrisburg, Pa., to Lansing, Mich., on Bang's disease.

Retirements.—Leslie J. Allen, Oklahoma City, Okla.; Ralph F. Vermilya, Boston, Mass.

BAI Gets Defense Rating

Through a ruling just made by the U. S. Civil Service Commission, the Bureau of Animal Industry has received a rating as a national defense agency.

Big Turkeys Win Place on Menus of Army and Navy

Heavy turkeys which farmers have found difficult to sell on the retail market can now have a place in the menus of the military forces

as a result of a change in specifications which the Poultry Committee of the Department of Agriculture recently induced the Procurement Division to make. The latter has now ruled that young hen turkeys weighing up to 16 lb. and young toms weighing up to 25 lb. may be bought for Army and Navy canteens.

To accommodate the poultry industry, the Procurement Division also made certain changes in the packing requirements for eggs.

Civil Service Commission Announces Examination for Junior Veterinarians

The United States Civil Service Commission has announced it will again receive applications for the position of junior veterinarian in the Bureau of Animal Industry, Department of Agriculture. An insufficient number of eligibles for filling this position resulted from the examination which closed in November, 1940. Qualified persons are urged to send their applications to the Commission's Washington office not later than February 17 if sent from states east of Colorado and not later than February 20, 1941, if sent from Colorado and states westward.

The salary of the position is $2,000 a year less a retirement deduction of 3½ per cent. The duties include the inspection of food animals and food products, control and eradication of disease, and the sanitary inspection of establishments. Applicants must have completed a full course of study in a veterinary college of recognized standing. Applications will also be accepted from senior students, provided they furnish proof of completion of the veterinary course during the existence of the eligible register. Competitors will be rated on professional questions covering the theory and practice of veterinary medicine, veterinary anatomy, physiology and pathology, and meat inspection.

Further information and application forms may be obtained from the secretary of the board of U. S. Civil Service Examiners at any first or second-class postoffice, or from the U. S. Civil Service Commission, Washington, D. C.

STUDENT CHAPTER ACTIVITIES

Kansas State College

At a meeting of the Kansas chapter on December 10, 1940, student speaker Martin Kadets of Natick, Mass., told of his experiences the past summer in Independence, Mo. The guest speaker was Dan Casement, prominent Kansas livestockman.

On January 14, a group of about 30 veterinary students' wives were officially organized

Ladies' Auxiliary to the Junior AVMA, Kansas State College.

as the ladies' auxiliary to the Kansas chapter. The officers are Mrs. John Erickson, president; Mrs. Arthur Case, vice-president; Mrs. Wm. Simic, secretary; and Mrs. Fred Ogilvie, treasurer. This is the first organization of its kind and plans are now being formed to make it national in scope. Mrs. W. Thompson and Mrs. E. J. Frick have consented to act in an advisory capacity.

During the January 14 meeting, colored motion pictures were shown on "The Control of Poultry Diseases," and officers were elected as follows: Hal Eyestone, president; De Vere Ratliff, vice-president; Hugh Callaway, secretary; Earl Mundell, treasurer; Merrill Rockhold, marshall; and Miss Hautess Rondeau, critic.

A special session was called on the afternoon of January 8 so that the chapter members could welcome President Wight of the national association, who visited the College while in Manhattan to attend the annual convention of the Kansas state association.

Following a brief address by Dr. Wight, Robert D. Immenschuh, president of the chapter, announced that every one of the 60 members of the senior class was making application for membership in the AVMA and handed Dr. Wight an envelope containing the applications. Thereby the Kansas seniors became "100% AVMA" for the third consecutive year.

WARREN J. DEDRICK, *Past Secretary.*

Cornell University

An election of officers was held by the Cornell chapter the past month, with the following results: Elwin Peterson, president; Frank Haner, vice-president; Andre L. Moul, secretary; George Young, treasurer; and Theodore Zimmerman, member-at-large.

EDGAR W. TUCKER, *Past President.*

AMONG THE STATES

Alaska

Earl Graves (K.S.C. '27) has accepted a position as veterinarian in charge of research and extension for the Alaska Agricultural Experiment Station.

After receiving a Master of Science degree at the University of Wisconsin in 1933, Dr. Graves served as veterinarian at the Wisconsin state game and fur farm at Poynette and as head of the veterinary control laboratory for the Wisconsin state department of agriculture at Madison. For a time he conducted a private practice in Plymouth, Wis.

Before going to Wisconsin, Dr. Graves worked with fur breeders in the Alaskan territory.

Arkansas

The cattle breeders' associations of Arkansas have petitioned the legislature to appropriate funds to continue the brucellosis-control program. Attention was invited to the 53 counties which had been "cleaned up" notwithstanding that the work was interrupted last year owing to lack of such an appropriation.

California

On January 7, 1941, a bill was introduced in the state legislature requesting an appropriation of $1,000,000 for the establishment of a veterinary college in California. What the outcome will be, no one knows, but if the legislators argue as long as the veterinarians have (pro and con), it may be a number of years before a decision is reached.

W. L. CURTIS, *Resident Secretary.*

District of Columbia

Last month District commissioners gave the health department authority to quarantine any dog which the department officials believe to have been exposed to a mad dog.

The action followed a suggestion that certain dogs might have been bitten by a dog which later bit a small boy. The boy had run to help the animal after it was struck by an automobile.

The regulation states that the health officer may direct the dog's owner to apply the quarantine rather than require the animal to be sent to the pound. Such quarantines may last only 60 days.

Georgia

The Georgia State Board of Veterinary Examiners were entertained at a luncheon given by the Atlanta Veterinary Medical Society, December 23.

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J. E. Severin was elected president of the Atlanta Veterinary Medical Society at the organization's annual meeting, held at the Atlanta Athletic Club, December 19. Joseph Tucker was elected vice-president and Charles C. Rife was reëlected secretary-treasurer.

CHARLES C. RIFE, *Secretary.*

Idaho

With the change in state political administration, Edwin T. Powell (Wash. '10) was succeeded as state veterinarian by Thomas A. Elliot (Wash. '15).

The Bang's disease program has received special attention and it was decided by Dr. Elliot to adopt the combination test-and-slaughter and vaccination method of control.

A. K. KUTTLER, *Resident Secretary.*

Indiana

Newly installed Governor Stricker has reappointed J. L. Axby as state veterinarian.

Iowa

November 4, 1940, on the Lester Vegors farm near Stratford, Iowa, M. E. Pomeroy of that town administered live erysipelas culture and anti-erysipelas serum to Vegors' 148 head of swine. This is the first herd in Iowa ever to be treated by the simultaneous method of erysipelas immunization.

Present at the immunization of the Vegors herd were J. S. Koen of the Hog Cholera Control Division, U. S. Bureau of Animal Industry, and H. J. Shore, laboratory director of the Fort Dodge Serum Co., both of whom took an active part in the first immunization of farm herds against hog cholera in Dallas county 30 years ago. Also present were J. A. Barger, BAI inspector in charge for Iowa, State Veterinarian H. A. Seidell, and several local practitioners.

Approval for experimental use of live erysipelas culture in Iowa follows extensive application of the serum-culture method of immunization in Nebraska the past three years. Since its appearance in northwestern Iowa about eight years ago, the disease has spread rapidly and at present is prevalent in many Iowa counties, especially in the southwestern section of the state, where it is exceptionally widespread and virulent.

Applications for permission to use live culture are furnished by the state veterinarian's office. These must be returned carrying the joint signatures of the local veterinarian and his client. A copy is then forwarded to the federal laboratory at Lincoln, Neb., and enough culture is sent to take care of the herd. The culture carries an eight-day dating. Following its use (it is to be used only on already infected premises) the veterinarian mails back another form listing certain data and post-vaccination observations.

A report from Dr. Pomeroy one week after immunization of the herd stated that the animal had an uneventful reaction other than a little stiffness. Fort Dodge Laboratories furnished the serum for this work.

New York

Cornell University's 33rd annual conference for Veterinarians was held on January 8-10 at the New York State Veterinary College, Cornell University, Ithaca, with 330 veterinarians in attendance. The first day was devoted to small animal practice; the second to general practice, and the last day to large animal diseases. Some of the featured topics were canine nutrition, calfhood vaccination for Bang's disease and problems in horse breeding.

The following papers were presented:

"Amputation of the Tail of the Dog," H. C. Stephenson, Ithaca.

"The Use and Abuse of Blood Counts," Peter Olafson, Ithaca.

"The Nutritional Requirements of Dogs," C. M. McCay, Ithaca.

"Canine Leptospirosis," W. S. Monlux, Ithaca.

"Applied Anatomy of the External Ear of the Dog," Malcolm E. Miller and Ralph E. Witter, Ithaca.

"The Lacroix Operation for Drainage of the External Ear," Gerry B. Schnelle, Boston, Mass.

"A Discussion of Some Cases from the Small Animal Clinic," H. J. Milks, Ithaca.

"What About the Future of Veterinary Practice?" W. A. Hagan, Ithaca.

"Radiography of the Diseases of Bones," Gerry B. Schnelle, Boston, Mass.

"Some Common Problems in Horse Breeding," Capt. W. E. Jennings, Front Royal, Va.

"The Physiological Action of Some Common Drugs," H. H. Dukes and H. T. Batt, Ithaca.

"The Treatment of Mastitis with Acriflavine," S. D. Johnson, Ithaca.

"The Significance of Long-Chained Streptococci in Breed Smears of Market Milk," Jean Ferguson, Ithaca.

"Developments in Calfhood Vaccination Against Bang's Disease," R. R. Birch, Ithaca.

"Technics for the Practicing Veterinarian in Diagnosing Animal Parasitisms," D. W. Baker, Ithaca.

"Horseshoes," J. N. Frost, Ithaca.

"Recent Research Developments in the Preservation and Handling of Bovine Semen," G. W. Salisbury, Ithaca.

"Phenothiazine Therapy," John W. Britton, Ithaca.

"Some Phases of Sterility in Cattle," M. G. Fincher, Ithaca.

The evening of the first day the Cornell Veterinary Alumni Association held its annual dinner and meeting on the campus, with approximately 250 in attendance. The second afternoon a special program in laboratory and clinical practice was given in which each department of the college participated.

The conference dinner held on the second evening was limited to men and equaled the attendance record that was made last year. Two hundred and seventy-five were present and heard Peter Olafson extend the greetings of the college. Talks about "The Veterinarian in Army Service" by Captain W. E. Jennings and "Trichinosis and State Meat Inspection," by State Senator Thomas C. Desmond were timely subjects and were well received. Professor K. M. Dallenbach of the psychology department of the arts college demonstrated the lie detector.

W. S. STONE, *Reporter.*

• • •

Lederle Laboratories, Inc., have announced the death, on December 23, 1940, of Creighton M. Hutchins, director of veterinary sales. Mr. Hutchins had been associated with the company for more than 25 years. His position is being filled by Dr. Clarence Campbell.

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A regular meeting of the Veterinary Medical Association of New York City was held at the

Hotel New Yorker in New York City, December 4.

William S. Monlux of the New York State Veterinary College spoke on canine leptospirosis. In a discussion of Dr. Monlux's presentation, it was pointed out that although cats are susceptible to leptospirosis, they do not become infected as readily as do dogs.

An election of officers was held, with the following results: C. E. DeCamp, president; B. J. Finkelstein, vice-president; and J. J. Merenda, secretary-treasurer (reëlected). R. W. Gannett is chairman of the board of censors; other members of the board are S. H. Shindell, W. Ulmer, C. G. Goubeaud and E. R. Cushing.

South Dakota

The annual meeting of the South Dakota Veterinary Medical Association was held at the Carpenter Hotel in Sioux Falls, December 12-13, with J. M. Baily of Parker presiding. Paul Meyers, secretary of the Sioux Falls Chamber of Commerce, delivered the address of welcome. President Baily responded.

The two-day program consisted of the following contributions and contributors:

"Lesions of Infectious Diseases of Swine," T. W. Munce, Sioux City, Iowa.
"Swine Erysipelas," Frank Breed, Lincoln, Neb.
"Activities of the U. S. Bureau of Animal Industry in South Dakota," Neil Plank, Pierre.
"Poultry Diseases," C. D. Lee, Iowa State College, Ames, Iowa.
"Disease Problems in Feeder Cattle," A. H. Schmidt, Triumph, Minn.
"Sheep Diseases," W. L. Boyd, University of Minnesota, St. Paul, Minn.
"Activities of the State Livestock Sanitary Board," R. S. Robinson, secretary of the Board.

A banquet held on the evening of the first day was attended by about 100 veterinarians, their wives and friends.

G. E. Melody of Gettysburg was elected president; D. L. Cotton of Beresford, vice-president; and J. T. McGilvrary of Sioux Falls, secretary-treasurer.

The ladies' auxiliary was active throughout the session. At a luncheon meeting which was arranged by Mrs. McGilvrary and presided over by Mrs. H. D. Perry of Yankton, it was voted to donate $25 to the scholarship fund of the American Veterinary Medical Association. This luncheon was made possible by generous contributions from Allied Laboratories, Inc., Norden Laboratories, The Corn States Serum Company, Fort Dodge Serum Co., Jensen-Salsbery Laboratories, Inc., Grain Belt Serum Co., and Nelson Laboratories.

GEORGE E. MELODY, *President.*

Utah

The 14th annual meeting of the Intermountain Livestock Sanitary Association was held at the Newhouse Hotel in Salt Lake City, January 13-15. Attendance: approximately 100, from seven intermountain states, comprising the prominent figures in the livestock sanitary service of the region. The subjects presented and the contributors were:

Address of Welcome, by Mayor Ab Jenkins of Salt Lake City.
Response, by A. K. Kuttler, Boise, Idaho.
"Acetonemia of Cows," P. H. Graves, Idaho Falls, Idaho.
"Infectious Catarrhal Enteritis of Turkeys," Wayne C. Binns, Logan, Utah.
"Chemotherapy in Veterinary Medicine," James Farquharson, Division of Veterinary Medicine, Colorado State College.
"Bacillary Hemoglobinuria," L. R. Vawter, University of Nevada, Reno, Nev.
"Problems in Small Animal Practice," B. I. Copple, Boise, Idaho.
"The Recent Outbreak of Hemorrhagic Septicemia in Mule Deer and Other Diseases of Wild Life," A. J. Holt, Bear River Bird Refuge.
"The Veterinarian in National Economics," L. A. Merillat, editor, Journal of the American Veterinary Medical Association, Chicago, Ill.
Exhibit of pathological specimens and discussion of them by C. L. Davis, Branch Pathological Laboratory, U. S. Bureau of Animal Industry, Denver, Colo.
"Laparotomy in Horses and Cattle and Other Surgical Operations" (illustrated with colored motion pictures), James Farquharson.
"Problems in Cattle Practice" (*ibid.*).
"Problems of Fertility and Sterility," R. W. Phillips, Animal Husbandry Department, Utah State College of Agriculture.
"Recent Advances in the Control of Brucellosis" (in man), Orin Ogilvie, M.D., Medical Division, University of Utah.
"Swine Erysipelas," Glen C. Holm, University of Idaho.
"Sidelights on Swine Erysipelas," H. J. Shore, Fort Dodge, Iowa.
"A Report on Calfhood Vaccination in Montana," Howard Welch, Montana Agricultural Experiment Station, Bozeman, Mont.

A. H. Francis of Denver, Colo., officiated as toastmaster at the banquet and Mrs. C. L. Jones, president of the women's auxiliary, directed the ladies' entertainment. The officers elected to administer the Association's affairs for the coming year are: A. K. Kuttler of Boise, Idaho, president; A. C. Johnson of Cedar Valley, Utah, first vice-president; L. R. Vawter of Reno, Nev., second vice-president; F. H. Melvin of Cheyenne, Wyo., third vice-president; and W. H. Hendricks of Salt Lake City, Utah, secretary-treasurer (reëlected).

COMING MEETINGS

Small Animal Hospital Association. Los Angeles, Calif. February 4, 1941. W. K. Riddell, secretary, 3233 W. Florence Ave., Los Angeles, Calif.

Connecticut Veterinary Medical Association. Hartford, Conn. February 5, 1941. George E. Corwin, secretary, Room 285 State Office Bldg., Hartford, Conn.

New York City, Veterinary Medical Association of. Hotel New Yorker, New York, N. Y. February 5, 1941. J. J. Merenda, secretary, 136 W. 53rd St., New York, N. Y.

Dallas-Fort Worth Veterinary Medical Society. Dallas, Texas. February 6, 1941. R. L. Rogers, Jr., secretary, Route 2, Gordon, Texas.

Houston Veterinary Association. Houston, Texas. February 6, 1941. W. T. Hufnall, secretary, 1612-14 E. Alabama Ave., Houston, Texas.

St. Louis District Veterinary Medical Association. 7800 Olive St. Rd., St. Louis, Mo. Feb. ruary 7, 1941. J. P. Torrey, secretary, 555 N. 14th St., East St. Louis, Ill.

Chicago Veterinary Medical Association. Hotel Sherman, Chicago, Ill. February 11, 1941. G. S. Elwood, secretary, 5449 Broadway, Chicago, Ill.

Missouri Short Course for Graduate Veterinarians. Columbia, Mo. February 11-13, 1941. J. L. Wells, secretary, 1817 Holmes St., Kansas City, Mo.

Virginia Conference for Graduate Veterinarians. Virginia Polytechnic Institute, Blacksburg, Va. February 11-13, 1941. (Business meeting of Virginia State Veterinary Medical Association to be held in connection with conference on February 11, at 7:00 p. m.) A. J. Sipos, secretary, 1102 State Office Bldg., Richmond, Va.

Alabama Veterinary Medical Association. Alabama Polytechnic Institute, Auburn, Ala. February 11, 1941.

Alabama Conference for Graduate Veterinarians. Alabama Polytechnic Institute, Auburn, Ala. February 12-14, 1941. R. S. Sugg, dean, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala.

Southeastern Michigan Veterinary Medical Association, Medical Arts Bldg., 3919 John R St., Detroit, Mich. February 12, 1941. F. D. Egan, secretary, 17422 Woodward Ave., Detroit, Mich.

Kansas City Veterinary Medical Association. Kansas City, Mo. February 17, 1941. S. J. Schilling, secretary, Box 167, Kansas City, Mo.

San Diego County Veterinary Medical Association. Zoölogical Research Bldg., Balboa Park, San Diego, Calif. February 17, 1941. Paul D. DeLay, secretary, State Poultry Pathological Laboratory, Balboa Park, San Diego, Calif.

Sixth North American Wildlife Conference. Memphis, Tenn. February 17-19, 1941. J. E. Shillinger, chairman, Committee on Arrangements, Fish and Wildlife Service, Washington, D. C.

Colorado State College Short Course for Veterinarians. Colorado State College, Fort Collins, Colo. February 17-20, 1941. I. E. Newsom, dean, Veterinary Division, Colorado State College, Fort Collins, Colo.

Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. February 19, 1941. Charles Eastman, secretary, 725 S. Vancouver Ave., Los Angeles, Calif.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa. February 26, 1941. A. Henry Craige, Jr., secretary, University of Pennsylvania, Philadelphia, Pa.

Massachusetts Veterinary Association. Hotel Westminster, Boston, Mass. February 26, 1941. H. W. Jakeman, secretary, 44 Bromfield St., Boston, Mass.

Louisiana Short Course for Veterinarians and Louisiana Veterinary Medical Association. Louisiana State University, Baton Rouge, La. February 26-27, 1941. C. M. Heflin, secretary, 2130 Tulip St., Baton Rouge, La.

DEATHS

Wm. A. Smith of Heron Lake, Minn., died at the age of 46 on January 13, 1941.

Born at Gaza, Iowa, August 30, 1894, Dr. Smith was graduated from the Ontario Veterinary College in 1918. He joined the Association in 1919.

George W. Foelschow of Palm City, Calif., died at the age of 45 in January of 1941.

Dr. Foelschow was born at Aurelia, Iowa, February 3, 1894, and was graduated from the San Francisco Veterinary College in 1916. He joined the Association in 1928.

H. Langevin of Crookston, Minn., died in December of 1940.

Dr. Langevin was graduated from the McGill Veterinary College in 1886. He was a charter member of the Minnesota State Veterinary Medical Society, and is believed to have been the first graduate veterinarian to practice in Minnesota.

Morton S. Whitcomb of St. Paul, Minn., died on November 30, 1940, at the age of 75.

A graduate of the Chicago Veterinary College, class of '92, Dr. Whitcomb was employed by the Minnesota State Live Stock Sanitary Board from 1904 until 1931, when he was retired from active service because of ill health. He was secretary and executive officer of the Board in 1907 and 1908. He was a member of the AVMA from 1904 to 1938.

Dean E. Bleecker of Columbus, Wis., died on January 14, 1941, at the age of 56.

Dr. Bleecker was born at Hubbleton, Wis., October 13, 1884, and was graduated from the Chicago Veterinary College in 1909. He joined the Association in 1919.

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An' Related Topics

Dogs in Turkey

As I visited in Turkey I was much impressed by the number and value of Turkish dogs. Every city and village has its horde of yellowish, shaggy-haired dogs, about the size of our collies. They lie outside of stone houses and mud huts, ready to devour the refuse that is thrown out into the gutters. Without these dogs sanitary conditions would be much more hazardous than they are. It has been said that these dogs are without names and without masters, but recognize their own exclusive right to their own village or precinct. A dog that ventured to intrude into a territory not his own would fare ill indeed. As in my travels I approached a village I found the barking of the many village dogs a frightening sound. But I learned that these dogs of Turkey bark merely to announce the approach of strangers and will not attack them.—*S. Louisa Stockwell in Our Dumb Animals.*

British Army 100 Per Cent Horseless

Says *The Veterinary Journal* editorially in its April 1940 issue:

> In the British Army this replacement [horses for motors] has been 100 per cent. We must presume that those in authority have confidence that the machine can perform efficiently those duties which previously fell to horses and mules. This may or may not be the case but it is hoped sincerely that the confidence will be completely justified. . . It is a great humanitarian movement. Animals have no war aims; they are simply innocent participants at the will of their masters. . . This Utopia is largely one of conjecture and the real trial has not yet occurred under all types of war conditions. . . Many speaking with authority say that the rôle of the horse and the mule is not finished. . . The lessons of the Abyssinian and Spanish wars are of too recent date to be ignored.

Major R. E. Wall *(ibid.)* under the title "Remount Duty and Remounts" writes a classical article on the subject in which he warns that the scarcity of grooms, stable

(*Continued on page xxii*)

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An' Related Topics

(*Continued from page xx*)

hands, horseshoers and veterinarians in the military service is apt to be a misfortune since time is required to train specialists in the art of horsemanship. "Lack of foresight and preparation leads to high mortality and long periods of incapacity," the author declares.

Shifting the Population

It is said that there is a shortage of over 1,250,000 skilled craftsmen in the United States: machinists, draftsmen, tool makers and pattern makers. One of the remedies proposed is to move some of the 5 million low-income farmers to town, and another is to move the industrial plants to them. But, says a third, what will happen when the billions to be spent for plants and machinery dwindle to zero as peace returns to this upset planet?

Lard and Bacon

In most all countries where hogs are raised abundantly, the bacon type has been preferred because of lard surpluses. This order has been reversed in Germany to meet the immediate needs in meat and lard. From many sources comes the belief that the war in Europe is going to change the livestock picture by loss of ground in the production of fine breeds of hogs, cattle and sheep.

Narcotic Addiction

Since the enactment of the Harrison Narcotic Act in 1914, drug addiction among Americans has greatly decreased. In 1877, one out of every 400 persons was an opium addict. Out of a population of 46 millions, 350,000 lb. of raw opium were imported. At the present time with a population of 132 million, the annual importation averages 150,000 lb., which is practically the amount needed for medical purposes. The average *per capita* consumption was 53 gr. in 1937. In 1939, it was less than 8.5 gr.

(*Continued on page xxiv*)

For
ALL THE VITAMINS
Proved Essential to
DOG HEALTH
You can confidently recommend NEW

...PLUS

Sensational NEW HEALTH FACTORS

Independent laboratory assays show Ken-L-Ration contains every vitamin recognized as important to dog health —essential to good coat, sturdy bone and muscle and resistance. And now Ken-L-Ration has added extra vitamins and health factors (some substances so recently isolated they have not been assigned vitamin names)—substances which the most advanced animal nutritionists believe are new and extremely important keys to better dog health. In addition, Ken-L-Ration is made with the good, lean meat accepted as one of a dog's most important foods. Yet this new Ken-L-Ration costs no more.

All the Meat in Ken-L-Ration is Government Inspected

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CHART of All 107 Breeds, $1; three for $2. Judy's *Dog Encyclopedia*, all dog subjects, $5. *Dog World* monthly, $2 for one year; $3 for two years; $5 for five years. JUDY PUBLISHING COMPANY, 3323 Michigan Blvd., Chicago, Ill.

THE AVMA will pay 25 cents plus postage for the following back issues of the JOURNAL: February 1940 and April 1940. Must be in good condition. Address: Journal of the AVMA, 600 S. Michigan Ave., Chicago, Ill.

For Sale

PRACTICES, locations and partnerships furnished and sold—all states. F. V. Kniest, 1537 So. 29th St., Omaha, Neb.

Wanted

TERRITORY supporting 3 physicians, 3 dentists and 2 druggists needs a veterinarian. Four creameries, including largest co-op in state. Address: A. H. Borgerson, M.D., President, Commercial Club, Sebeka, Minn.

SALESMEN to represent New York company distributing complete line of medicaments, ampules, tablets, ointments, vitamins and sundries. Men with experience and following preferred. Address: "NY2," c/o Journal of the AVMA.

EXPERIENCED veterinarian, age 29, wishes to buy a lucrative mixed or small animal practice. Will consider working for a veterinarian for a year with privilege of purchase or partnership. Address: "CO," c/o Journal of the AVMA.

WANTED AT ONCE young veterinarian to act as technician for artificial dairy cattle breeding association in northern Illinois. Must have good personality. Salary $2,400 and ex ens 's. Apply by mail or in person to The American Dairy Cattle Club, 11 S. La Salle St., Chicago, Ill.

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FREE SAMPLE
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An' Related Topics

(*Continued from page xxii*)

In short, the usage is not out of proportion to the medical needs.

The decrease is due to several factors, not the least of which is the physicians' care in not creating the narcotic habit by the too liberal use of narcotics on their patients. Another factor is the high cost of the opiates and prohibiting the refilling of physicians' prescriptions by druggists.

The careless dieting of patients hospitalized for surgical operations may result in harmful depletion of invigorating elements. The preoperative diet should contain more than the normal vitamin requirement to avoid depletion that will devitalize the patient.

Joseph Meister, who in 1885 at the age of 9 was the first person to take the Pasteur treatment for rabies, committed suicide in Paris recently, on account of despondency over being separated from his family through the German occupation of that city.

The territory along the English Channel, now being subjected to repeated bombardments by the R.A.F., is famous in veterinary history. It was the veterinarians of this region who organized the first veterinary society. The date was June 23, 1829, and the place, Caen, in Normandy.

"It'll take more than a fractured bone to keep old Buck, a 'possum hound, from hunting 'possums," says an Associated Press report from Elberton, Ga.

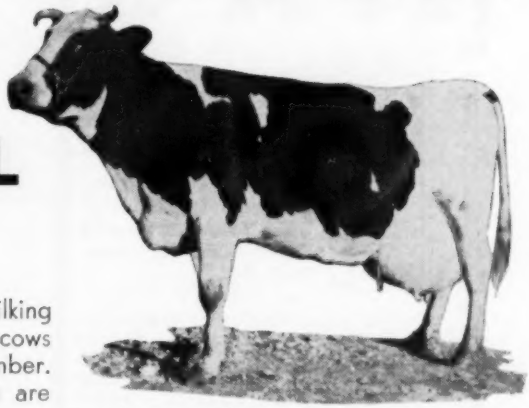
Buck, incapacitated by a broken leg, accompanied Sheriff John Starke on a hunt a short time ago—in a wheelbarrow—and, wheeled by his master, a tenant farmer, treed four 'possums without leaving his seat.

(*Continued on page xxvi*)

VETERINARIANS SAVE CLIENT $40 IN FEED COSTS THE FIRST MONTH

After Prescribing

CON-O-MINERAL Compound!



Camp McKinley Pontiac, prize Holstein owned by Paul McElmeel, Greeley, Iowa.

Owner: Paul McElmeel, Greeley, Iowa. Milking 11 cows but 15 in herd. Holsteins. 11 cows averaged 50 lb. butterfat each for December. Belong to the test association and figures are accurate as records are maintained.

This herd was top herd in butterfat average in State of Iowa in the years 1937 and 1938. Has ranked near the top succeeding years.

Feed Analysis was made and instructions followed during the month of December. There was scarcely any change needed in the ration except in the calcium and phosphorus contents. CON-O-MINERAL was used in the percentage recommended. This herd gave practically the same amount of milk during December and percentage of butterfat remained about the same. Not a cow went off feed as was a common occurrence formerly. SAVING IN FEED COST was figured on 15 cows and not just the 11 that were milking. This saving amounted to $40 for the month over and above the cost of the 1½ sacks of CON-O-MINERAL. In other words, he saved about $50 in feed and after paying for his CON-O-MINERAL he had $40 saving left.

One of the veterinarians who treated this herd writes:

"Am enclosing picture of his prize cow, Camp McKinley Pontiac, which produced 700.7 lb. butterfat in 344 days of 1940, twice daily milking. Carried calf 258 days of the 344 days.

"Mr. McElmeel has given us permission to use this information in any legitimate manner we desire, but he insists upon having the picture returned to him after we have finished with it.

"It occurred to me that you would be interested in this case report and would like to use it in some form of advertising."

Write Today for FREE VPC FEED ANALYSIS SERVICE

Possibly some of the best producing herds in your community are showing slight disorders. Perhaps a minor change in rations will get better results. Or, perhaps you can be instrumental in helping some valued clients save feed money. Ask for blank forms to be filled out by yourself, or your clients.

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Single Bottle	$ 2.00
1-4 Dozen and One FREE	5.00
1-2 Dozen and Two FREE	8.00
1 Dozen and Four FREE	15.00
2 Dozen and Four FREE	25.00

AGENTS

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Graduate Courses in Pathology and Bacteriology (including immunology) extending through one session.

For Catalogue and further information, address

GEORGE ALEXANDER DICK,
Dean, Veterinary Faculty

An' Related Topics

(Continued from page xxiv)

Since Sweden has fallen under the control of Germany, and it is doubtful that a Nobel prize will be awarded in the near future, steps are being taken by former Nobel prize winners to have the awarding authority transferred to the United States.

Bad teeth, poor vision and flat feet are the causes of most of the rejections of volunteers for the military service, according to a report coming from the New York metropolitan area.—*From the American Journal of Public Health.*

The European corn borer has now reached Illinois in its trek westward across the Corn Belt. One outbreak was found in Lake county and another in Will county near Joliet. The early panic over the corn borer, however, has calmed down. There are tillage methods of control.

While taking their Fox Terrier to the hospital for treatment, Mr. and Mrs. Henry Peterson were bitten about the hands. H. L. Deuill and his assistant, Allen Hatch, of the Peoria Veterinary Hospital pronounced the dog rabid and their diagnosis was confirmed by another veterinarian, Wm. Dixon. The city health department started the victims on the Pasteur treatment while the dog was held for observation.—*From Peoria (Ill.) Star.*

Biologists Cotton and Uhler, wildlife experts of the Bureau of Biological Survey, U. S. Department of the Interior (*Wildlife Leaflet*, BS-162), regard birds a priceless heritage in curtailing the depredation of insects since a large proportion of their food consists of insects. Entomologists and ornithologists agree that insectivorous birds render incalculable aid to agriculture, horticulture and forestry. "They level off the waves of insect abundance" and they maintain an equilibrium in the biotic complex.

Panzootics of

Canine Distemper

are prone to occur during winter and early spring months.

Lockhart products for the control of canine distemper were developed in America, by Americans, for combating distemper as it is found in America. They were the first agents developed anywhere in the world for the control of this filterable virus disease. They have stood the test of more than fifteen years of use.

The exclusive methods employed in producing and testing Lockhart Homologous Serum insure a product of known, high, uniform potency.

The steadily increasing use of Lockhart Homologous Serum by discriminating graduate veterinarians is the best indication of its value.

New Hospital Package at Lower Cost

For increased convenience and lower costs a larger container of Homologous Anti-Canine Distemper Serum (Lockhart) is now available, as follows:

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Quart	250 cc bottle	$10.00

Less usual 10% trade and 2% cash discount.

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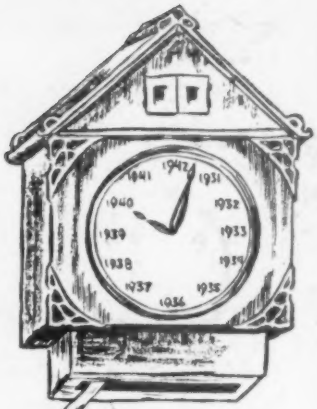
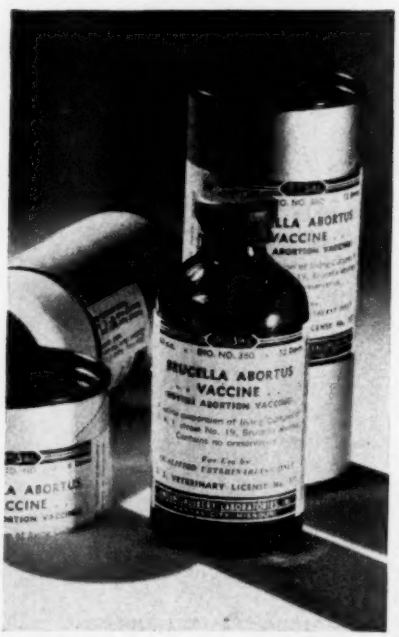
MEMBER Veterinary Exhibitors Assn

Dr. John R. Mohler, chief of the U.S.B.A.I., recommends calfhood vaccination in Bang's Disease control. His plan is endorsed by the U. S. Live Stock Sanitary Association.



THE PENDULUM IS ~~SWINGING~~ *has Swung*

to official endorsement of Brucellosis Vaccination



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Also packages of 1-5 c.c. (1 dose), Bio. No. 370 ..... $0.25
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